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THE SOCIAL COST OF LEGAL AND ILLEGAL DRUGS IN BELGIUM

DR. DELFINE LIEVENS

DR. NICK VERHAEGHE

NELE SCHILS

PROMOTERS

PROF. DR. FREYA VANDER LAENEN

PROF. DR. LIEVEN ANNEMANS

PROF. DR. KOEN PUTMAN

PROF. DR. LIEVEN PAUWELS

PROF. DR. WIM HARDYNS

UNIVERSITEIT GENT

Vrije Universiteit Brussel

ABBREVIATIONS

APR-DRG	All Patient Refined Diagnosis Related Groups
ATC	Anatomical Therapeutic Chemical code
BELSPO	Belgian Federal Science Policy Office
BELSPO	Belgian Science Policy Office
BMCDDA	Belgian Monitoring Centre for Drugs and Drug Addiction
BRSI	Belgian Road Safety Institute
CAW	Centra Algemeen Welzijnswerk
CGG - SSM	Centra Geestelijke Gezondheidszorg - Service Santé Mentale
COPD	Chronic obstructive pulmonary disease
CTIF-CFI	Belgian Financial Intelligence Processing Unit
DALY	Disability Adjusted Life Years
DALY	Disability-adjusted life year
DG EPI	General Directorate of Penitentiary Institutions
DRUID	Driving under the Influence of Drugs, Alcohol and Medicines
DSM-IV	Diagnostic and Statistical Manual of Mental Disorders, 4th. Edition
FAMHP	Federal Agency for Medicines and Health products
FASFC	Federal Agency for Safety of the Food chain
FPS	Federal Public Service
GP	General practitioner
IBW	Initiatief beschut wonen
ICD	International Classification of Diseases
IHP	Initiative d'habitation protégée
INAMI	Institut National d'Assurance Maladie-Invalidité

JEP	Regie voor Gevangenisarbeid/ La Régie du Travail pénitentiaire
MAIS	Maximum Abbreviated Injury Scale
MHD	Minimum hospital data
MOF/FQI	Minors who have committed and offence (Misdrijf Omschreven Feit/Fait Qualifié Infraction)
MPG	Minimale psychiatrische gegevens
MSOC-MASS	Medisch-sociaal opvangcentra - Maison d'Accueil Socio-Sanitaire
MSP	Maison de soins psychiatrique
MZG	Minimale ziekenhuisgegevens
NCET	National Centre of Electronic Surveillance
NICC	National Institute for Criminalistics and Criminology
NIHDI	National Institute for Health and Disability Insurance
PVT	Psychiatrisch verzorgingstehuis
RGA	Coordination of Prison Labour
RHM	Résumé hospitalier minimal
RIZIV	Rijksinstituut voor Ziekte- en Invaliditeitsverzekering
RPM	Résumé psychiatrique minimum
RR	Relative risk
SAF	Substance-attributable fraction
SVPP	Strategic Safety and Prevention Plan
TDI	Treatment Demand Indicator
UNODC	United Nations Office on Drugs and Crime
VBSW/BPSM	Federal Bureau for Statistics and Measurement
VOS/MD	Minors in a Worrisome Living Situation (Verontrustende Opvoedingssituatie/Mineurs en Danger)
WHO	World Health Organization

WHO	World Health Organization
WIV-ISP	Wetenschappelijk Instituut voor Volksgezondheid - Institut Scientifique de Santé Publique
WODC	Wetenschappelijk Onderzoek en Documentatie Centrum
YLD	Years lived with disease
YLL	Years of life lost

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INTRODUCTION

The current study 'The social cost of addictive substances in Belgium', called 'SOCOST' and commissioned by the Federal Services on Science Policy, carries out a first estimate of social costs for addictive substances in Belgium. The research has five objectives:
(1) To define the concept of 'social cost' and to draw up an inventory of various methods used in (inter)national studies that estimate social costs on different addictive substances (illegal drugs, tobacco, alcohol and psychoactive medication).
(2) To screen the existing external national and international data(sources) that can be accessed and used to carry out the first estimation of social costs of addictive substances in Belgium.
(3) To carry out a first estimation of social costs for addictive substances in Belgium and to formulate policy recommendations based on its findings.
(4) To make a SWOT-analysis of the research method and to formulate recommendations to improve future estimations.
(5) To formulate general conclusions and policy recommendations based on the results of the first estimation of social costs in Belgium.

This report focuses on the third research objective, by describing the results of the social cost estimation of the addictive substances alcohol, tobacco, illicit drugs, and psychoactive pharmaceuticals in Belgium for the year 2012. The social cost related to health, crime, traffic accidents and integrated projects are reported.

This SOCOST-research project can be considered as a cost-of-illness study (Bloom, Bruno, Maman, & Jayadevappa, 2001). The aim of the SOCOST-study was to estimate the substance-attributable costs of addictive substances to the Belgian society. Therefore three cost components were considered: (1) the direct costs, (2) the indirect cost, and (3) the intangible costs related to substance (mis)use. Direct costs are those related to the resources used dealing with substance use and related medical conditions, accident or its proximate effects (e.g. hospitalisation, physician consultations, medication use) and the substance attributable crimes (e.g. police investigation, incarceration). Indirect costs are costs related to for example productivity losses, early retirement, premature mortality due to the presence of a disease, accident or crime. Intangible costs are non-financial welfare costs borne by individuals such as pain or suffering as well as the value of lost life (Moore & Caulkins, 2006; Single et al., 2001).

In this study, a prevalence-based approach was used measuring the consequences of substance misuse in a given time period (in casu the year 2012). The latter is a function of past and current substance misuse (Moore & Caulkins, 2006). Three methods are used to estimate the costs associated with substances' (mis)use: substance specific data, a proration technique, and unit expenditure. For the substance specific methodology, no further calculations are necessary, because the costs are exclusively for drug policy. The other methods are used for substance programmes that are embedded within broader budget categories.

This means that a process must be followed to ascribe a portion of that broader budget category to the substance programme. Typical approaches are unit cost calculations or the proration technique (Van Malderen, Vander Laenen & De Ruyver, 2009). Productivity losses were estimated using the human capital approach measuring current and future productivity losses which occurred in the present year. The intangible costs were calculated using the concept of disability-adjusted life years (DALYs) (Drummond, Sculpher, Torrance, O'Brien, & Stoddart, 2005).

This report describes the third research objective of SOCOST. The report consists of four chapters reporting the methods and results for the different major cost categories (health, crime, traffic, and integrated projects) and a chapter reporting the missing costs. The chapters in which the different cost categories are elaborated are subdivided in two sections: a method-section and a results-section. At the end of each chapter, an overview of the costs is provided.

HEALTH

1. METHODS

1.1. Introduction

Below, an overview is provided on the methods used to estimate the substance-attributable direct, indirect and intangible costs related to 'health'. In table 1, an overview is provided of the different cost components pertaining to the three major cost categories 'direct costs', 'indirect costs', and 'intangible costs' that were included in the SOCOST research project.

Table 1: Cost categories related to 'Health' included in the SOCOST research project

Main cost category	cost items
DIRECT COSTS	
Inpatient care	hospitalisation
	general hospital admissions
	psychiatric hospital admissions
	sheltered housing
	psychiatric nursing homes
	inpatient rehabilitation
	specific projects
Outpatient care	physician contacts
	day centres
	medical-social care centres
	mental health care centres
	home-based nursing care
	specific projects
Pharmaceuticals	
Prevention, research and coordination	
INDIRECT COSTS	
Disability	short-term disability (≤365 days)
	long-term disability (>365 days)
Lost productivity from premature mortality	
INTANGIBLE COSTS	
Disability-adjusted life years (DALYs)	societal value of a DALY

1.2. Substance-attributable fractions

The epidemiological concept of substance-attributable fractions (SAFs) (Kleinbaum, Kupper, & Morgenstern, 1982) was used to quantify the proportion of the total morbidity and premature mortality of diseases and conditions known to be causally related to substance (mis)use. The calculation of the SAFs allows for the estimation of the proportion of cases of a disease or condition that may be attributed to the consumption of the substances under study (Jones, Bellis, Dedman, Sumnall, & Tocque, 2008). Three steps can be distinguished to calculate SAFs:

1. Identification of the diseases and conditions associated with substance (mis)use (based on ICD-9 diagnosis)[1];
2. Identification of the prevalence of substance consumption and relative risks (the risk of developing the diseases and conditions identified in step 1 related to the level of substance consumption);
3. Calculation of the SAFs using the information from step 2.

First, the diseases and conditions were identified known to be associated with substance (mis)use. The 'International guidelines for estimating the costs of substance abuse – 2001 Edition' (Single et al., 2001) were used as the basis for the identification of diseases and conditions associated with substance (mis)use. In addition, social cost studies were examined to search for substance-attributable diseases and conditions not listed in the 'International guidelines' (see Appendix 1a-d). Second, input data were searched to calculate age- and sex-specific SAFs for the substances alcohol, tobacco, illicit drugs, and psychoactive pharmaceuticals including (1) substance consumption data, and (2) data related to the risk of developing one of the diseases and conditions.

The substance consumption data were derived from the 'Belgian Health Interview Survey 2013' (Tafforeau et al., 2015). For alcohol, four sex-specific consumption classes were considered: (i) abstainers; (ii) class I: drinking 0-19.99 g/day (females), 0-39.99 g/day (males); (iii) class II: drinking 20-39.99 g/day (females), 40-59.99 g/day (males); and (iv) class III: drinking ≥40 g/day (females), ≥60 g/day (males) (Table 2)[2]. For tobacco, three categories were considered: i) current; (ii) former; and (iii) never smokers (Table 3). For illicit drugs and psychoactive pharmaceuticals, two consumption classes were considered: (i) users; and (ii) non-users (Table 4 and Table 5). In the 'Health Interview Survey', illicit drugs considered were cannabis, cocaine, amphetamine/ecstasy, heroin or substitutes, and other drugs. Psychoactive pharmaceuticals included antidepressants, analgesics, and anxiolytics, sedatives and hypnotics. The following age-bands were considered for each of the substances (except tobacco): 15-19, 20-39, 40-59, 60-79, and ≥80 years. For tobacco however, different age-bands (15-34, 35-54, 55-64, 65-74, and ≥75 years) were considered to match with the age-specific relative risks of the tobacco-attributable diseases.

[1] ICD-9, The International Classification of Diseases, 9th revision is used to code and classify morbidity data from patients. This information was derived from http://www.cdc.gov/nchs/icd.htm on 16/07/2015

[2] In the Health Interview Survey, drinking categories II and III were considered as one category 'Hazardous drinking, females >20g/day and males >40g/day'. WHO-data related to the 'estimated proportion of population of consumption categories II and III for Eur-A region (including Belgium)' (Rehm et al., 2004) were used to allow for an estimation of the proportion of population in the drinking categories II and III for the SOCOST-study

Table 2: Age- and sex-specific alcohol consumption per drinking category in Belgium, 2012

age-band (years)	males				females			
	abstinent	cat. I	cat. II	cat. III	abstinent	cat. I	cat. II	cat. III
15-19	26.4%	71.0%	1.3%	1.3%	22.3%	75.3%	1.8%	0.6%
20-39	12.9%	84.5%	1.3%	1.3%	22.4%	75.6%	1.5%	0.5%
40-59	10.7%	82.5%	3.3%	3.5%	16.6%	76.1%	5.5%	1.8%
60-79	12.8%	79.4%	3.6%	4.2%	24.1%	70.9%	4.0%	1.0%
≥80	28.6%	69.9%	0.7%	0.8%	47.4%	49.6%	2.4%	0.6%

source: Health Interview Survey, 2013 (Scientific Institute of Public Health, WIV-ISP)

cat. I: females, 0-19.99 g/day; males, 0-39.99 g/day

cat. II: females, 20-39.99 g/day; males, 40-59.99 g/day

cat. III: females, ≥40 g/day; males, ≥60 g/day

Table 3: Age- and sex-specific tobacco smoking prevalence in Belgium, 2012

age-band (years)	males			females		
	current	former	never	current	former	never
15-34	28.0%	11.2%	60.8%	20.9%	10.7%	68.4%
35-54	30.7%	22.9%	46.4%	24.7%	16.3%	59.0%
55-64	26.7%	38.7%	34.6%	25.3%	26.7%	48.0%
65-74	18.3%	52.2%	29.5%	13.6%	16.9%	69.5%
≥75	11.0%	38.4%	50.6%	2.4%	10.4%	87.2%

source: Health Interview Survey, 2013 (Scientific Institute of Public Health, WIV-ISP)

Table 4: Age- and sex-specific illicit drug use in Belgium, 2012

age-band (years)	males		females	
	illicit drug use	no illicit drug use	illicit drug use	no illicit drug use
15-19	8.7%	91.3%	14.0%	86.0%
20-39	16.6%	83.4%	6.0%	94.0%
40-59	2.8%	97.2%	0.7%	99.3%
60-79	0.7%	99.3%	0.2%	99.8%
≥80	0.0%	100.0%	0.0%	100.0%

source: Health Interview Survey, 2013 (Scientific Institute of Public Health, WIV-ISP)

Table 5: Age- and sex-specific psychoactive pharmaceuticals use in Belgium, 2012

age-band (years)	males		females	
	medication use	no medication use	medication use	no medication use
15-19	1.0%	99.0%	2.7%	97.3%
20-39	5.8%	94.2%	9.0%	91.0%
40-59	15.5%	84.5%	25.6%	74.4%
60-79	21.7%	78.3%	37.9%	62.1%
≥80	31.5%	68.5%	58.8%	41.2%

source: Health Interview Survey, 2013 (Scientific Institute of Public Health, WIV-ISP)

Relative risk data related to the diseases associated with substance (mis)use were obtained from previous studies (Appendix 2a-d). A number of diseases and conditions is by definition fully attributable to the substance (SAF=1). For the diseases and conditions that are partially attributed to the substance, age- and sex-specific SAFs were calculated using the following formula (Formula 1) (Kleinbaum et al., 1982):

$$SAF = \frac{P_i(RR_i-1)}{\sum P_i(RR_i-1)+1}$$

where P_i signifies the prevalence of substance consumption in consumption class i (e.g. for tobacco: i=0, never smokers; i=1, current smokers; i=2, former smokers) and RR_i signifies the relative risk of the disease in consumption class i. An overview of the calculated SAFs for the different substances can be found in Appendix 3a-d. Diseases and conditions fully attributable to the substance were not included in these appendices since these SAFs are equal to 1 (Table 6). As an example of how the different SAFs were calculated, we describe the alcohol-attributable fraction for liver cancer in males aged 40-59 years, drinking between 0-39.99 g/day. The proportion males aged 40-59 years drinking between 0-39.99 g/day was 82.5% (Table 2). The relative risk estimate for liver cancer in men drinking between 0-39.99 g/day was 1.45 (Appendix 2a). Applying the formula gives the following estimate of the alcohol-attributable fraction for liver cancer:

$$SAF = \frac{82.5\%\ (1.45-1)}{[10.7\%(1-1)]+[82.5\%(1.45-1)]+[3.3\%(3.03-1)]+[3.5\%(3.60-1)]+1} = 0.24$$

So, 24% of all liver cancers in males aged 40-59 years is attributable to those drinking between 0-39.99 g/day.

Table 6: Diseases and conditions known to be fully attributable to substance (mis)use

substance	ICD-9	disease/condition	source
ALCOHOL			
	291	alcoholic psychosis	Single et al. 2001
	303	alcoholic dependence syndrome	Single et al. 2001
	305	alcohol abuse	Single et al. 2001
	331.7	degeneration of nervous system due to alcohol	Rehm et al. 2007
	357.5	alcoholic polyneuropathy	Single et al. 2001
	425.5	alcoholic cardiomyopathy	Single et al. 2001
	535.3	alcoholic gastritis	Single et al. 2001
	571	alcoholic liver disease/cirrhosis	Single et al. 2001
	760.71	foetal alcohol syndrome	Rehm et al. 2007
	980	ethanol and methanol toxicity	Single et al. 2001
TOBACCO			
	989.84	toxic effect of tobacco/nicotine	Single et al. 2001
ILLICIT DRUGS			
	304.3	mental disorder due to use of cannabinoids	Single et al. 2001
	304.2	mental disorder due to use of cocaine	Single et al. 2001
	304.4	mental disorder due to amphetamine & other stimulants	Single et al. 2001
	304.5	mental disorder due to use of hallucinogens	Single et al. 2001
	304.7; 304.8	mental disorder due to multiple drug use	Single et al. 2001
	292	drug psychosis	Single et al. 2001
	760.72; 760.75	newborn drug toxicity	Single et al. 2001
	965.00	poisoning by opium	Single et al. 2001
	965.01	poisoning by heroin	Single et al. 2001
	965.02	poisoning by methadone	Single et al. 2001
	965.09	poisoning by other synthetic narcotics	Single et al. 2001
	970.81	poisoning by cocaine	Single et al. 2001
	969.9	poisoning by cannabis	Single et al. 2001
	968.9	poisoning by local anaesthetics (cocaine)	Single et al. 2001
PSYCHOACTIVE PHARMACEUTICALS			
	304.0	mental disorder due to use of opioids	Single et al. 2001
	304.1	mental disorder due to use of sedatives/hypnotics	Single et al. 2001
	304.7; 304.8	mental disorder due to multiple drug use	Single et al. 2001
	969	poisoning by psychotropic agents	Single et al. 2001
	967	poisoning by sedative-hypnotic drugs	Single et al. 2001
	965.09	poisoning by other opioids	Single et al. 2001

1.3. Calculation methods used

1.3.1. Direct costs

To estimate the direct costs associated with substances' (mis)use, we estimated what is called the 'attributable' costs. In general, this was obtained in three different ways: (1) substance specific costs are distinguished for projects (e.g. federal addiction fund, Flemish action plan tobacco, alcohol and drugs, federal research programme drugs of BELSPO) and for organizations (e.g. specialised addiction treatment centres, association for alcohol and other drug problems, BMCDDA). These costs are retraceable in documents such as national budgets or year reports and no calculation methods are required in this case. (2) the use of the number of cases with substance (mis)use multiplied with a corresponding 'unit cost' or standard cost incurred (e.g. hospitalisation costs in general and psychiatric hospitals, disability and premature mortality costs), or (3) the use of a proportion of a global budget that is associated with substance (mis)use (e.g. substance-attributable costs of physician contacts, sheltered housing, home-based nursing care).

1.3.1.1. Inpatient care

Hospitalisation

For the substance-attributable hospitalisation costs, admissions (further defined as 'hospital care episodes') to both general hospitals and psychiatric hospitals were accounted for. Furthermore, hospital care episodes in general hospitals included inpatient as well as day hospital care (surgical and non-surgical) hospitalisations.

a. General hospitals

First, the number of attributable admissions and an estimation of the mean cost per admission were determined for each type of disease/condition. The number of substance-associated general hospital care episodes were calculated using the 'Minimum Hospital Data' (MHD) ('Minimale Ziekenhuisgegevens' [MZG]/'Résumé Hospitalier Minimal' [RHM]) . This database contains hospital-based data including medical data, nursing-based data, administrative data (Federal Public Service (FPS) Health, 2015). Two different data sets including the number of hospital care episodes for the substance-attributable diseases were obtained from the MHD: the first being age band-specific (age-bands: 0-5, 6-19, 20-39, 40-59, 60-79, ≥80 years), and the second being sex-specific. Both data extractions needed to be separated because of the fact that combining age- and sex-specific data resulted in a substantial number of 'small cells' (defined as less than 5 cases) for a set of diseases causing possible privacy issues[3]. The data from the two datasets was subsequently combined to obtain the weighted age-band- and sex-specific number of hospital care episodes for each disease or condition (Appendix 4a-d).

[3] This information was provided in writing by the Federal Public Service Health, Data Management Unit on 03/10/2014

We illustrate this with the calculation of the number of age band- and sex-specific hospital care episodes for chronic obstructive pulmonary disease (COPD) (n= 27,216 inpatient hospital care episodes):

- Sex-specific dataset: 16,589 hospital care episodes in male patients (61.0%) and 10,627 in female patients (39.0%);
- Age band-specific dataset: 4,708 inpatient hospital care episodes in patients aged between 40-59 years. So, we assumed 2,870 (61.0%) male inpatient hospital care episodes and 1,838 (39.0%) female inpatient hospital care episodes.

As already described in the 'Calculation of substance-attributable fractions' section, the age-bands for tobacco were different than those considered for the other substances. We recalculated the number of patients in age-bands for tobacco based on the initial age-bands from the MHD dataset. We assumed equal numbers of admissions per five year age-bands. For example, the number of rheumatic heart disease hospital care episodes in those aged 60-79 years was 262. So, we assumed 65.5 cases in the age-group 60-64, 65.5 cases in the age-group 65-69 and so on. This enabled us to calculate the number of hospital care episodes for the age-bands used in tobacco.

Cost data for the hospital and for the surgical hospital day care episodes were derived from the 'National Database Medical Diagnosis/Care and Cost' (Federal Public Service & National Institute for Health and Disability Insurance, 2015). This database contains disease-specific (based on 'All Patients Refined Diagnosis Related Groups' [APR-DRG][4]) mean costs/hospital care episode including costs of hospitalisation stay ('verpleegdagprijs'/'prix de journée'), fees, and pharmaceutical costs. Since the unit costs derived from the 'National Database Medical Diagnosis/Care and Cost' were 2011 data[5], all costs were actualized to account for the year 2012 euros.

Since the disease-specific data related to hospital resource use were based on ICD-9 and cost data on APR-DRG, the number of hospital care episodes related to a specific disease might overlap with several APR-DRGs. For example, there were 27,216 inpatient hospital care episodes for COPD (ICD-9 490-492) spread over 17 APR-DRG codes: 55 belonged to DRG 002, 2 cases to DRG 003, 109 cases to DRG 004… So, a weighted average unit cost/ICD-9 diagnosis was calculated accounting for the distribution of the number of cases/ICD-9 diagnosis over the APR-DRGs and the corresponding cost/APR-DRG (Appendix 5).

The calculation of the substance-attributable costs for inpatient and surgical day care episodes was calculated by multiplying the age- and sex-specific SAFs, the number of age- and sex-specific number of hospital care episodes and the weighted average disease-specific unit costs (Formula 2):

[4] APR-DRG: a patient classification scheme which provides a means of relating the type of patients a hospital treats (i.e., its case mix) to the costs incurred by the hospital. Derived from https://www.hcup-us.ahrq.gov/db/nation/nis/APR-DRGsV20MethodologyOverviewandBibliography.pdf on 29/06/2015

[5] For SOCOST, the 'Minimum Hospital Data' of the year 2011 were used, since these were the most recent data available. The reason for this was that, at the time of our data-request, MHD for the year 2012 for a number of hospitals was not yet available (this information was provided in writing by the Federal Public Service Health, Data Management Unit on 26/09/2014).

Attributable cost= $SAF_{age- \& sex-specific}$ * *hospital care episodes* $_{age- \& sex-specific}$ * *weighted mean cost* $_{age- \& sex-specific}$

We illustrate this for the calculation of the inpatient tobacco-attributable trachea, bronchus, and lung cancer cost in females aged 65-74 years. The SAF for trachea, bronchus, and lung cancer in females aged 65-74 years was 0.80 (Appendix 3b). The number of hospital care episodes in this population was 994 (Appendix 4b), while the unit cost/care episode was 7,376 euros (Appendix 5). Applying the above described formula gives:

*Attributable cost = 0.80 * 994 * 7,376 euros = 5,884,341 euros*

For the calculation of the substance-attributable non-surgical hospital day care, the same formula was used except for the unit cost. In Belgium, financing of non-surgical day care is based on a number of lump sums (Table 7) (Van de Sande, Swartenbroekx, Van de Voorde, Devos, & Devriese, 2012). For SOCOST, as unit cost, a weighted average cost of 175.24 euros (average of the different lump sums included in Table 7) was used. In appendix 10, an overview is provided of the different nomenclature numbers/'group'.

Table 7: Overview of the different lump sums for non-surgical day care in Belgium[6]

type of lump sum	lump sum
lump sum 'group 1'	€ 156.08
lump sum 'group 2'	€ 190.65
lump sum 'group 3'	€ 275.37
lump sum 'group 4'	€ 196.22
lump sum 'group 5'	€ 204.01
lump sum 'group 6'	€ 243.05
lump sum 'group 7'	€ 200.68
lump sum 1 'chronic pain'	€ 218.50
lump sum 2 'chronic pain'	€ 121.53
lump sum 3 'chronic pain'	€ 94.76
lump sum 'portacath'	€ 26.84
average	**€ 175.24**

Source: National Institute for Health and Disability Insurance (RIZIV/INAMI), 2011

b. Psychiatric hospitals

Psychiatric hospitals' resource use included 'full-time' and 'part-time' hospital care episodes in psychiatric hospitals ('Psychiatrisch Ziekenhuizen'/'Hôpitaux Psychiatriques') and in psychiatric wards in general hospitals ('Psychiatrische Afdelingen in een Algemeen Ziekenhuis'/'Services Psychiatriques en Hôpitaux Généraux'). Data on the number of age- and sex-specific hospital care episodes for substance-attributable mental disorders were obtained from the 'Minimum Psychiatric Data' (MPD) ('Minimale Psychiatrische

[6] This information was derived from the National Institute for Health and Disability Insurance (Rijksinstituut voor Ziekte- en Invaliditeitsverzekering [RIZIV] /Institut National d'assurance Maladie-Invalidité [INAMI]) 'National Agreement between the care institutions ('verpleeginrichtingen') and health insurance organisations ('verzekeringsinstellingen') from 24/06/2011

Gegevens' [MPG]/'Résumé Psychiatrique Minimum' [RPM]) also provided by the Federal Public Service Health[7]. This database contains data related to mental disorders based on the 'Diagnostic and Statistical Manual of Mental Disorders, 4th. Edition (DSM-IV) (American Psychiatric Association, 2000). For the current research project data for a number of substance-attributable mental disorders (Appendix 6) were extracted including age band- and sex-specific number of hospital care episodes and the mean number of hospitalisation days per hospital care episode/substance-attributable mental disorder (Appendix 7). The age-bands considered were 0-5, 6-19, 20-39, 40-59, 60-79, and ≥80 years.

Cost data related to hospital care episodes in psychiatric facilities (both psychiatric hospitals and psychiatric wards in general hospitals) were not included in the 'National Database Medical Diagnosis/Care and Cost' database[8]. As a unit cost, a mean day price ('verpleegdagprijs'/'prix de journée') for the year 2012 of 281.43 euros[9] was used. The age- and sex-specific hospitalisation cost/substance-attributable mental disorder was then calculated as follows (Formula 3):

$$\textit{Attributable cost} = \textit{hospital care episodes}_{\textit{age- \& sex-specific}} * \textit{mean number of hospitalisation days}_{\textit{age- \& sex-specific}} * \textit{weighted mean cost}_{\textit{age- \& sex-specific}}$$

As an example, the psychoactive pharmaceuticals' cost for sedative-, hypnotic-, or anxiolytic-related disorders in males aged 20-39 years is calculated. The number of hospital care episodes in males aged 20-39 years was 156 with a mean hospitalisation stay/care episode of 57 days and the mean hospitalisation cost/day was 281.43 euros:

*Attributable cost= (156 * 57) * 281.43 euros = 2,510,773 euros*

Sheltered housing and psychiatric nursing homes

For sheltered housing ('initiatieven beschut wonen' [IBW]/'initiatives d'habitations protégées' [IHP]) and psychiatric nursing homes ('psychiatrische verzorgingstehuizen' [PVT]/'les maisons de soins psychiatriques' [MSP]), no specific data related to the substance-attributable expenditures was available. Therefore, the substance-attributable expenditures for sheltered housing and psychiatric nursing homes were estimated using information regarding the total expenditures for those facilities and the proportion of substance-related mental disorders. First, the total expenditures for sheltered housing and psychiatric nursing homes were obtained from the health insurance institute (RIZIV/INAMI) and were 41,869,000 euros and 93,281,000 euros respectively (RIZIV, 2013a). Second, the number of substance-attributable admissions was estimated using the 'Feedback MPG 2012' (Federal Public Service, 2014). This dataset included admissions to psychiatric hospitals, psychiatric wards in general hospitals, sheltered housing, and psychiatric nursing homes (Federal Public Service, 2014). The proportion of admissions due to a

[7] This data were obtained in writing from the Federal Public Service Health, DG Healthcare on 20/10/2014
[8] This information was provided in writing by the Federal Public Service Health, DG Healthcare on 25/03/2015
[9] The mean day price of 281.43 € was calculated based on a mean day price for the year 2012 of 272.21 € (month 1-6) and 290.64 € (month 7-12). This information was derived from an excel-file available on the NIHDI website (http://www.riziv.fgov.be/nl/themas/kost-terugbetaling/door-ziekenfonds/verzorging-ziekenhuizen/Paginas/verpleegdagprijzen-ziekenhuizen.aspx#.VOHhIC703dU)

substance-related mental disorder were estimated at 13.40% and 8.08% for sheltered housing and psychiatric nursing homes respectively (Table 8).

Table 8: Proportion of substance-attributable mental disorders in sheltered housing and psychiatric nursing homes

DSM-IV diagnosis	sheltered housing		psychiatric nursing home	
	number	proportion	number	proportion
child and adolescent disorders	69	1.87%	87	2.76%
dementia & other cognitive disorders	14	0.38%	52	1.65%
adjustment disorders	84	2.28%	55	1.74%
substance-related disorders	494	**13.40%**	255	**8.08%**
psychotic disorders	1,694	45.96%	1,627	51.54%
mood disorders	507	13.75%	209	6.62%
anxiety disorders	63	1.71%	36	1.14%
somatoform disorders	4	0.11%	9	0.29%
impulse-control disorders	30	0.81%	34	1.08%
sexual & gender identity disorders	30	0.81%	16	0.51%
factitious disorders	2	0.05%	0	0.00%
eating disorders	4	0.11%	1	0.03%
sleep disorders	1	0.03%	0	0.00%
dissociative disorders	4	0.11%	0	0.00%
personality disorders	356	9.66%	165	5.23%
mental retardation	78	2.12%	499	15.81%
other disorders	50	1.36%	33	1.05%
major diagnosis axis 3	10	0.27%	4	0.13%
missing	192	5.21%	75	2.38%
total	**3,686**	**100.00%**	**3,157**	**100.00%**

source: Feedback MPG 2012 (Federal Public Service Health)[10]

Third, the substance-attributable expenditures for sheltered housing and psychiatric nursing homes were calculated as follows:

- Sheltered housing: 41,869,000 euros * 13.40%
- Psychiatric nursing home: 93,281,000 euros * 8.08%

[10]This information was derived from the website from the Federal Public Service Health on 25/03/2015 http://www.health.belgium.be/eportal/Healthcare/Healthcarefacilities/Registrationsystems/MPD%28MinimumPsychiatricData%29/Publications/index.htm#.VOIITS703dU

Finally, data related to the number of substance-attributable mental disorder admissions to sheltered housing and psychiatric nursing homes (Federal Public Service (FPS) Health, 2012) were used to allow for an estimation of the distribution of the expenditures across the different substances (Table 9).

Table 9: Substance-attributable admissions to sheltered housing and psychiatric nursing homes, Belgium, 2012

substance	sheltered housing		psychiatric nursing home	
	admissions	proportion	admissions	proportion
alcohol	951	68.22%	418	72.82%
tobacco	8	0.57%	10	1.74%
illicit drugs	202	14.49%	28	4.88%
psychoactive pharmaceuticals	83	5.95%	29	5.05%
polysubstance	150	10.76%	89	15.51%
total	**1,394**	**100.00%**	**574**	**100.00%**

Source: Minimum Psychiatric Data 2012, FPS Health, 2012

Subsequently, the proportion of each substance was multiplied with the total substance-attributable expenditures for sheltered housing and psychiatric nursing homes (Formula 4):

*Attributable cost= total expenditures * proportion substance-attributable mental disorders * proportion substance-specific admissions*

In this calculation approach, it is assumed that all substance-attributable admissions are equally valued. For example, the substance-attributable costs associated with psychoactive pharmaceuticals' use in psychiatric nursing homes were calculated as follows:

Attributable cost= *(93,281,000 euros * 8.08%) * 5.05% = total euros*

Inpatient rehabilitation

Crisis intervention centres and therapeutic communities

The expenditures of the Belgian National Health Insurance Institute (RIZIV-INAMI) for crisis intervention centres and therapeutic communities with the convention "rehabilitation for addicts" are substance specific. However, we estimate the costs across type of substance with information from the TDI (Treatment Demand Indicator). [11] The TDI is a monitoring tool developed by the EMCDDA to gain insight into the characteristics, risk behaviours and drug use patterns of people with drug problems. This database provides the number of new clients entering drug treatment with information on the type of

[11] This methodology has also been applied for the day centres and medical-social care centres subsidised with the convention rehabilitation for addicts.

treatment centre (e.g. day centre, crisis intervention centre, therapeutic community, medical-social care centre) and the primary substance use (alcohol, illicit drugs or psychoactive medication).

1.3.1.2. Outpatient care

Physician contacts

The calculation of the substance-attributable physician contact costs included contacts with general practitioners (GPs), psychiatrists, and medical specialists (other than psychiatrists). For the three categories, no data related to the costs that could be attributed to substance (mis)use or to the number of substance-attributable contacts were available. The substance-attributable costs were estimated starting from the total expenditures for physician visits and the number of the physicians under study[12].

a) General practitioners

For GPs, the substance-attributable expenditures were estimated based on the total expenditures for ambulatory physician contacts in 2012 being 1,868,384,000 euros[13], the number of GPs in Belgium, a weighted average SAF, and the number of substance-attributable hospital care episodes to allow for a distribution of the total substance-attributable expenditures across the different substances. First, the proportion of GPs to the total number of physicians was calculated. In 2012, there were 32,583 physicians of which 12,363 GPs (37.94%)[14]. Second, a weighted average SAF[15] was calculated based on the number of hospital care episodes per ICD-9 diagnosis. This resulted in an average SAF of 0.22. The substance-attributable expenditures for GP contacts were calculated as follows (Formula 5):

*Attributable cost= (total physician contact expenditures * proportion GPs) * weighted average SAF*

In a last step, data related to the number of sex-specific hospital care episodes per substance was used to allow for an estimation of the substance-attributable expenditures across the different substances (Table 7).

[12] An alternative calculation of the substance-attributable costs for physician visits will be applied based on the total expenditures/physician group for physician contacts.

[13] This information was derived from the RIZIV/INAMI 'Statistics of healthcare' for the year 2012 on 25/06/2015 http://www.riziv.fgov.be/SiteCollectionDocuments/statistieken_geneeskundige_verzorging_2013.pdf

[14] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

[15] The weighted average SAF was calculated accounting for, for all four substances, the SAF and number of hospital care episodes per substance-attributable ICD-9 diagnosis

Table 10: General hospital substance-attributable hospital admissions in Belgium, 2012

substance	number of hospital care episodes	proportion
males		
alcohol	27,421	21.31%
tobacco	52,439	40.75%
illicit drugs	878	0.68%
psychoactive pharmaceuticals	2,716	2.11%
females		
alcohol	16,833	13.08%
tobacco	22,819	17.73%
illicit drugs	852	0.66%
psychoactive pharmaceuticals	4,734	3.68%
total	**128,692**	**100.00%**

Source: Minimum Hospital Data 2011, FPS Health

Subsequently, the calculated substance-attributable expenditures for GPs were multiplied with each sex- and substance-specific percentage resulting in an estimation of sex- and substance-specific costs.

b) Psychiatrists

The substance-attributable expenditures for psychiatrist consultations were estimated using a similar approach as for GPs. The total expenditures for physician contacts in 2012 were 1,871,345,000 euros[16], while the proportion of psychiatrists to the total number of physicians (1,890 vs. 32,583) was 5.80%[17]. Second, the proportion of substance-related mental disorders was calculated (16.86%) using information from the 'Feedback Minimum Psychiatric Data 2012' (Feedback MPG 2012). (Table 11).

Table 11: Proportion of substance-attributable mental disorders in Belgium, 2012

DSM-IV diagnosis	number	proportion
child and adolescent disorders	965	3.84%
dementia & other cognitive disorders	600	2.39%
adjustment disorders	1,047	4.16%
substance-related disorders	**4,242**	**16.86%**
psychotic disorders	8,185	32.54%
mood disorders	4,619	18.36%
anxiety disorders	587	2.33%
somatoform disorders	109	0.43%
impulse-control disorders	279	1.11%
sexual & gender identity disorders	177	0.70%

[16] This information was derived from the RIZIV/INAMI 'Statistics of healthcare' for the year 2012 on 25/06/2015 http://www.riziv.fgov.be/SiteCollectionDocuments/statistieken_geneeskundige_verzorging_2013.pdf

[17] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

factitious disorders	3	0.01%
eating disorders	168	0.67%
sleep disorders	1	0.00%
dissociative disorders	27	0.11%
personality disorders	1,589	6.32%
mental retardation	834	3.32%
other disorders	278	1.11%
additional codes	227	0.90%
major diagnosis axis 3	181	0.72%
missing	1,036	4.12%
total	**25,154**	**100.00%**

source: Feedback MPG 2012 (Federal Public Service Health)

We assumed an equal distribution of contacts with psychiatrists across mental disorders. Subsequently, the substance-attributable expenditures for psychiatrist contacts were calculated as follows (Formula 6):

*Attributable cost= (total physician contacts' expenditures * proportion psychiatrists) * proportion substance-related disorders*

In a last step, data related to the number of hospital admissions for substance-attributable mental disorders[18]) were used to allow for an estimation of the distribution of the expenditures across the different substances (Table 12).

Table 12: Psychiatric hospital substance-attributable hospital care episodes in Belgium, 2012

substance	hospital care episodes (n)	proportion
males		
alcohol	20,151	45.46%
tobacco	153	0.35%
illicit drugs	3,564	8.04%
psychoactive pharmaceuticals	2,259	5.10%
poly substance	2,710	6.11%
females		
alcohol	10,803	24.37%
tobacco	106	0.24%
illicit drugs	1,221	2.75%
psychoactive pharmaceuticals	2,367	5.34%
poly substance	993	2.24%
total	**44,327**	**100.00%**

source: Minimum Psychiatric Data 2012, Federal Public Service Health

[18] This data were obtained in writing from the Federal Public Service Health, DG Healthcare on 20/10/2014

For example, 69.83% (males, 45.46%; females, 24.37%) of total substance-attributable expenditures for psychiatrist consultations were assumed to be due to alcohol (mis)use.

c) Medical specialists

The substance-attributable expenditures for ambulatory contacts with medical specialists - other than psychiatrists – (e.g. cardiologists, oncologists, pneumologists) were also estimated in a similar way as the expenditures for GPs. For medical specialists, the substance-attributable expenditures were estimated based on the total expenditures for ambulatory physician visits (1,868,384,000 euros)[19], the proportion of medical specialists to the total number of physicians (9,043 vs. 32,583 → 27.75%)[20] and the same weighted average SAF as used for GPs (0.22). The substance-attributable expenditures for GP contacts were calculated as follows (Formula 7):

*Attributable cost= (total physician contact expenditures * proportion medical specialists) * weighted average SAF*

In a last step, data related to the number of sex-specific hospital care episodes per substance was used to allow for an estimation of the substance-attributable expenditures across the different substances (Table 12). Subsequently, the calculated substance-attributable expenditures for medical specialists were multiplied with each sex- and substance-specific percentage resulting in an estimation of sex- and substance-specific costs.

Day centres, medical-social care centres and mental health care centres

The majority of these expenditures is substance specific[21], except for the mental health care centres. A proration technique is applied to estimate the substance-attributable fraction of the mental health care centres in the Flemish region (CGG). Therefore, the EPD registration system is used. This system registers the duration of (offered and cancelled) activities according to the type of diagnoses. As for the mental health centres in the Walloon Region and Brussels (SSM), it is impossible to identify the substance attributable fraction, since no centralised registration system is available. Moreover, the TDI registration in 2012 was limited to five of the 111 "SSM/CGG" centres.[22]

Home-based nursing care

No specific data related to the number of people receiving home-based nursing care or expenditures associated with substance (mis)use were found. For the estimation of the substance-attributable domiciliary nursing care costs a similar approach was used as for calculating the substance-attributable hospitalisation costs based on the 'Minimum Hospital Data' (Federal Public Service (FPS) Health, 2015). To

[19] This information was derived from the RIZIV/INAMI 'Statistics of healthcare' for the year 2012 on 25/06/2015 http://www.riziv.fgov.be/SiteCollectionDocuments/statistieken_geneeskundige_verzorging_2013.pdf

[20] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

[21] The expenditures for day centres and medical-social care centres with the RIZIV/INAMI convention "rehabilitation for addicts" are substance specific. For the estimation of the costs across type of substance with TDI, we refer to page 14.

[22] This information was provided in writing by Eurotox, 06/01/2015.

our opinion, this was the most reliable data source to allow for an estimation of the expenditures for domiciliary nursing care due to substance (mis)use. First, the age- and sex-specific substance-attributable hospital care episodes/substance (Appendix 4a-d) were calculated by multiplying each age- and sex-specific SAF/disease (Appendix 3a-c) with the corresponding number of hospital care episodes resulting in the total number of sex-specific hospital care episodes per substance (Table 13).

Table 13: Substance-attributable hospital care episodes in general hospitals

substance	men	women	total
alcohol	27,421	16,833	**44,254**
tobacco	52,439	22,819	**75,258**
illicit drugs	878	852	**1,730**
psychoactive pharmaceuticals	2,716	4,734	**7,450**
total	**83,454**	**45,238**	**128,692**

Source: Minimum Hospital Data 2011, Federal Public Service Health

Second, the proportion of the total number of hospital care episodes per substance to the total number of hospital care episodes was calculated for 2011 (n=1,667,051)[23] (
Table 14). For example, there were 878 hospital care episodes in men due to illicit drug use. This represents 0.06% of the total of 1,667,051 hospital care episodes in Belgium for 2011[24].

Table 14: Sex-specific number of substance-attributable hospital care episodes to the total number of hospital care episodes in Belgium, 2011

substance	men	women	total
alcohol	1.65%	0.77%	**2.42%**
tobacco	3.11%	1.35%	**4.46%**
illicit drugs	0.06%	0.06%	**0.12%**
psychoactive pharmaceuticals	0.15%	0.27%	**0.42%**
total	**4.97%**	**2.45%**	**7.42%**

Finally, the proportion of sex-specific substance-attributable hospital care episodes/substance was multiplied with the total RIZIV/INAMI-expenditures for home-based nursing care (1,122,136,000 euros)[25]. For example, for tobacco in men this was 3.11% * 1,122,136,000 euros.

[23] This information was derived from the 'National Database Medical Diagnosis/Care and Cost' on 07/03/2015 https://tct.fgov.be/webetct/etct-web/html/nl/index.jsp

[24] For SOCOST, the 'Minimum Hospital Data' of the year 2011 were used, since these were the most recent data available. The reason for this was that, at the time of our data-request, MHD for the year 2012 for a number of hospitals was not yet available (this information was provided in writing by the Federal Public Service Health, Data Management Unit on 26/09/2014).

[25] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

1.3.1.3. Pharmaceuticals

The data for pharmaceuticals can be retrieved from the Farmanet/Pharmanet database. Farmanet/Pharmanet is a national drug consumption database with data on prescribed and reimbursed drugs sold in pharmacies (outpatient data). For the current research project data on pharmaceuticals used in addictive disorders (ATC-code N07B) were extracted, including the number of packages/modules dispensed, amount of the insurance contribution and amount of the co-payment by the patient.

1.3.2. Indirect costs

1.3.2.1. Disability

Expenditures related to disability included short-term (first year of disability – 'primaire arbeidsongeschiktheid' / 'incapacité primaire')[26] and long-term disability (>365 days of disability – 'invaliditeit' / 'invalidité'). First, we describe the methodology for the estimation of the substance-attributable expenditures for long-term disability, since the estimation of the short-term disability expenditures was based on data from long-term disability.

a) Long-term disability

No data related to the numbers of disabled that could be attributed to substance (mis)use was available. The basis for the calculation of the substance-attributable expenditures of long-term disability was the data related to the number of disabled people in Belgium in 2012 receiving a disability benefit provided by the 'National Institute for Health and Disability Insurance (RIZIV)[27]. In this database, the total number of sex-specific disabled people is provided subdivided in 17 disease groups (Table 15). These groups are in accordance with the major categories of the ICD-9 (e.g. infectious and parasitic diseases, diseases of the circulatory system).

Table 15: Sex- and disease group-specific invalids (>365 days of disability) in Belgium, 2012

Disease group	number of invalids	
	men	women
infectious & parasitic disorders	1,290	996
neoplasms	5,735	11,856
endocrine, nutritional & metabolic diseases	3,135	2,832
diseases of the blood	144	324
mental disorders	41,401	56,770
diseases of the nervous system & senses	7,745	9,124
diseases of the circulatory system	12,742	7,030
diseases of the respiratory system	3,240	2,558

[26] In 2012, for workers, the first week and for clerks, the first month is not taken into account because this is covered by a 'guaranteed wage'.

[27] Data related to the number of sex-specific invalids per disease group for the year 2012 was obtained from the National Institute of Health and Disability Insurance (RIZIV/INAMI), 'Dienst Uitkeringen'/'Le Service des Indemnités' on 29/04/2015

diseases of the digestive system	3,120	3,612
diseases of the genitourinary system	998	1,322
complications of pregnancy, childbirth & puerperium	0	527
diseases of the skin & subcutaneous tissue	627	916
diseases of the musculoskeletal system	35,524	44,119
congenital anomalies	677	947
conditions originating in the perinatal period	0	23
symptoms & ill-defined conditions	2,453	3,243
injury & poisoning	11,545	6,838
total	**130,376**	**153,037**

Source: National Institute for Health and Disability Insurance (RIZIV/INAMI), 2012

First, for each of the substances, the disease groups that are known to be associated with substance (mis)use had to be identified. For this, we used the list of ICD-9 diagnoses that are known to be fully or partially associated with substance (mis)use (Appendix 1a-d). For example for psychoactive pharmaceuticals, disease-groups including substance-attributable ICD-9 diagnoses included 'mental disorders' and 'injury & poisoning' (Appendix 1d). For each substance, using the data from Table 15, the number of disabled people pertaining to those disease-groups that are known to be associated with substance (mis) were calculated (Table 16).

Table 16: Sex-specific invalids for disease groups associated with substance (mis)use

disease group/substance	number of invalids	
	men	women
Alcohol		
neoplasms	5,735	11,856
mental disorders	41,401	56,770
diseases of the nervous system & senses	7,745	9,124
diseases of the circulatory system	12,742	7,030
diseases of the digestive system	3,120	3,612
diseases of the skin & subcutaneous tissue	627	916
Total	**71,370**	**89,308**
Tobacco		
neoplasms	5,735	11,856
diseases of the circulatory system	12,742	7,030
diseases of the respiratory system	3,240	2,558
Total	**21,717**	**21,444**
Illicit drugs		
infectious & parasitic disorders	1,290	996
mental disorders	41,401	56,770

injury & poisoning	11,545	6,838
Total	**54,236**	**64,604**
Psychoactive pharmaceuticals		
mental disorders	41,401	56,770
injury & poisoning	11,545	6,838
Total	**52,946**	**63,608**

Subsequently, for all diseases listed in Table 16, the specific number of disabled people that could be associated with substance (mis)use had to be estimated. To do this, two calculation approaches were used. One for the disease groups 'mental disorders' and 'injury and poisoning' and one for the other – somatic – disease groups. First, for the disease groups 'mental disorders' and 'injury & poisoning', the proportion was derived from the 'Minimum Psychiatric Data' feedback 2012 (Federal Public Service, 2014). 'Mental disorders' and 'injury & poisoning' were considered as one disease group since in the 'Minimum Psychiatric Data' substance-associated mental disorders and injury & poisoning pertain to the overall disease group 'substance-related disorders'. The overall proportion was found to be 16.86% (Table 11). For the substance 'alcohol, this resulted in an estimated 6,982 male and 9,574 female invalids suffering from a mental disorder. For the substances, 'illicit drugs' and 'psychoactive pharmaceuticals', this resulted in an estimated 8,929 male and 10,727 female disabled individuals suffering from a substance-related 'mental disorder' or 'injury & poisoning'. Next, the distribution of the number of invalids over the substances 'alcohol', 'illicit drugs', and 'psychoactive pharmaceuticals' had to be calculated. For this recalculation, data related to the number of hospital admissions for substance-attributable mental disorders (Federal Public Service (FPS) Health, 2012) were used. This resulted in an estimated 69.83% of all admissions to a psychiatric hospital, psychiatric ward in a general hospital, sheltered housing, and psychiatric nursing home associated with alcohol (mis)use, while for illicit drugs and psychoactive pharmaceuticals this was 10.79% and 10.44% respectively.

Finally, the number of substance-attributable disabled people could be calculated by the following formula (Formula 8):

> *Number of substance-attributable disabled people = (number of invalids * proportion substance-attributable disorders) * substance-specific proportion*

As an example, for the substance 'psychoactive pharmaceuticals', we describe how the number of substance-attributable disabled women suffering from a 'mental disorder' or 'injury & poisoning' was calculated. The number of disabled women due to a 'mental disorder' and 'injury & poisoning' was 63,608 (Table 16). The proportion substance-attributable disorders was 16.86% (Table 11) of which 10.44% were due to psychoactive pharmaceuticals:

> *Number of substance-attributable disabled women = (63,608 * 16.86%) * 10.44% = 1,119 women*

The other disease groups listed in Table 15 (neoplasms, diseases of the nervous systems & senses, diseases of the circulatory system, diseases of the digestive system, diseases of the skin, infectious diseases, and diseases of the respiratory system) were calculated in a different way. For each disease group, the SAF was calculated by calculating the proportion of the number of substance-attributable hospital care episodes to the total hospital care episodes/disease group (Table 17)

Table 17: Proportion substance-attributable hospital care episodes to the total hospital care episodes/disease group

disease group	substance-attributable hospital care episodes		total*[28]	proportion	
	men	women		men	women
Alcohol					
neoplasms	2,099	2,071	72,320	2.90%	2.86%
nervous system	2,335	1,948	113,670	2.05%	1.71%
circulatory system	10,187	5,407	201,941	5.04%	2.68%
digestive system	4,364	2,366	177,767	2.45%	1.33%
skin	30	18	58,387	0.05%	0.03%
Tobacco					
neoplasms	9,883	3,223	72,320	13.67%	4.46%
circulatory system	26,248	10,032	201,941	13.00%	4.97%
respiratory system	16,302	9,562	137,624	11.85%	6.95%
Illicit drugs					
infectious	205	136	29,959	0.68%	0.45%

* source: National Database Medical Diagnosis/Care and Cost

For each 'somatic disease' group, the sex-specific calculated fractions (Table 17) were multiplied with the number of invalids listed in table 16. This results in an estimation of the number of invalids that could be attributed to substance (mis)use (Table 18).

Table 18: Estimation of the number of invalids associated with substance (mis)use

substance	men	proportion	women	Proportion
alcohol	5,921	55.60%	7,418	68.97%
tobacco	2,824	26.52%	1,055	9.81%
illicit drugs	974	9.13%	1,162	10.81%
psychoactive pharmaceuticals	932	8.75%	1,119	10.41%
Total	**10,651**	**100.00%**	**10,754**	**100.00%**

[28] The column 'total' is not equal to the sum of the two previous columns (substance-attributable hospital care episodes for men and women), but is equal to the total hospital care episodes/disease group (independently if they are associated with substance use or not) derived from the National Database Medical Diagnosis/Care and Cost.

Next, a sex-specific weighted average disability benefit/day was calculated accounting for the sex- and statute (worker/clerk)-specific total number of disability days and the disability expenditures for the year 2012 in Belgium[29]. This resulted in a weighted average disability benefit per day of 46.32 euros and 39.04 euros for male and female disabled people respectively. The mean number of disability days per person was calculated by dividing the number of paid disability days (N=85,009,204) by the total number of disabled people (N=283,541)[30]. The mean number of disability days per invalid was 300. The total substance-attributable disability expenditures were subsequently calculated applying the following formula (Formula 9):

Attributable cost = $SAF_{sex\text{-}specific}$ ** disability benefit per day * mean number of disability days per year*

For example, there were an estimated 2,824 male disabled that could be attributed to tobacco use. The weighted average disability benefit for male invalids was 46.32 euros and the mean number of disability days was 300:

*Attributable cost= (2,824 * 46.32 euros) * 300 = 39,218,537 euros*

b) Short-term disability

First, the number of short-term disabled people pertaining to the substance-attributable disease groups had to be determined. No data related to the number of individuals suffering from short-term disability per disease group was however available.[31] So, we calculated the number of short-term disabled individuals per disease group based on the proportion of long-term disabled people per disease group. This occurred by using the input data from Table 15. For each disease group, the number of sex-specific long-term disabled individuals was divided by the total number of sex-specific disabled individuals resulting in the sex-specific proportion of long-term disabled per disease group (Table 19).

Table 19: Proportion of sex-specific long-term disabled per substance-attributable disease group

Disease group	number of invalids	
	men	women
infectious & parasitic disorders	0.99%	0.65%
neoplasms	4.40%	7.74%
mental disorders	31.74%	37.08%
diseases of the nervous system & senses	5.94%	5.96%
diseases of the circulatory system	9.77%	4.59%

[29] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

[30] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

[31] This information was obtained in writing from the National Institute of Health and Disability Insurance (RIZIV/INAMI), 'Dienst Uitkeringen'/'Le Service des Indemnités' on 28/04/2015

diseases of the respiratory system	2.48%	1.67%
diseases of the digestive system	2.39%	2.36%
injury & poisoning	8.85%	4.47%

For example, there were 11,856 long-term disabled women suffering from neoplasms and the total number of female long-term disabled was 153,089. So, the proportion was calculated as follows:

11,856 / 153,089 = 7.74%

Subsequently, each sex-specific proportion was multiplied with the total number of sex-specific short-term disabled individuals being 193,458 and 218,837 male and female individuals respectively (Table 20)[32].

Table 20: Number of short-term sex-specific disabled people per substance-attributable disease group

Disease group	men	women
infectious & parasitic disorders	1,913	1,421
neoplasms	8,505	16,913
mental disorders	61,397	80,984
diseases of the nervous system & senses	11,486	13,016
diseases of the circulatory system	18,896	10,029
diseases of the respiratory system	4,805	3,649
diseases of the digestive system	4,627	5,153
injury & poisoning	17,121	9,755
total	128,750	140,920

Second, the number of short-term disabled people that could be attributed to substance (mis)use had to estimated. For 'mental disorders' and 'injury and poisoning', the fraction was derived from the 'Minimum Psychiatric Data' feedback 2012 (Federal Public Service, 2014) and was found to be 16.86% (Table 11). So, the number of male (61,397) and female (80,984) short-term disabled was multiplied with 16.86%. For the other disease groups, the fraction was calculated in a same way as was applied for long-term disability.

For each disease group, the SAF was calculated by calculating the proportion of the number of substance-attributable hospital care episodes to the total hospital care episodes/disease group (Table 21)

[32] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

Table 21: Proportion substance-attributable hospital care episodes to the total hospital care episodes/disease group

disease group	substance-attributable hospital care episodes		total*[33]	proportion	
	men	women		men	women
Neoplasms	11,982	5,295	72,320	16.57%	7.32%
nervous system	2,335	1,948	113,670	2.05%	1.71%
circulatory system	36,435	15,439	201,941	18.04%	7.65%
digestive system	4,364	2,366	177,767	2.45%	1.33%
respiratory system	16,302	9,562	137,624	11.85%	6.95%
Infectious	205	136	29,959	0.68%	0.45%

* source: National Database Medical Diagnosis/Care and Cost

In Table 22, an overview is provided of the number of sex- and disease group-specific short-term disabled that could be attributed to substance (mis)use.

Table 22: Sex- and disease group-specific short-term disabled attributable to substance (mis)use

Disease group	men	women
infectious & parasitic disorders	13	6
neoplasms	1,409	1,238
mental disorders	10,354	13,657
diseases of the nervous system & senses	236	223
diseases of the circulatory system	3,409	767
diseases of the respiratory system	569	254
diseases of the digestive system	114	69
injury & poisoning	2,887	1,645
total	**18,992**	**17,859**

Next, a weighted average disability benefit/day was calculated accounting for the statute (worker/clerk)-specific total number of short-term disability days and the disability expenditures for the year 2012 in Belgium (RIZIV 2013b)[34]. This resulted in a weighted average disability benefit per day of 44.60 euros. The mean number of short-term disability days for the year 2012 was 70.08 days for men and 78.83 days for women[35]. The substance-attributable expenditures for short-term disability were then calculated as follows (Formula 11):

[33] The column 'total' is not equal to the sum of the two previous columns (substance-attributable hospital care episodes for men and women), but is equal to the total hospital care episodes/disease group (independently if they are associated with substance use or not) derived from the National Database Medical Diagnosis/Care and Cost

[34] This information was obtained in writing from the National Institute of Health and Disability Insurance (RIZIV/INAMI), 'Dienst Uitkeringen'/'Le Service des Indemnités' on 24/06/2015

[35] This information was obtained in writing from the National Institute of Health and Disability Insurance (RIZIV/INAMI), 'Dienst Uitkeringen'/'Le Service des Indemnités' on 24/06/2015

Attributable cost= *(number of substance-attributable disabled$_{sex\text{-}\ and\ disease\ group\text{-}specific}$ * weighted average short-term disability benefit/day) * mean number of short-term disability days/year$_{sex\text{-}spêcific}$*

Finally, to allow for a distribution of the sex-specific substance-attributable expenditures across the different substances, the proportional distribution of the number of long-term disabled as listed in Table 16 were applied.

1.3.2.2. Lost productivity from premature mortality

The estimated costs of productivity loss due to premature mortality were based on the mortality data for the year 2012 provided by the Federal Public Service Economy[36]. This database contains data on the number of deaths for different causes (by ICD-10 diagnosis) for different ages. For the current research project, mortality data associated with the diseases that are known to be related with substance (mis)use (Appendix 1a-d) were extracted (description of the relevant diseases by ICD-10 were similar to those by ICD-9).

First, for each ICD-10 diagnosis, the number of potential productive life years lost was calculated by subtracting age at death from retirement age (65 years) and multiplied with the number of deaths at the given age (Appendix 8). As an example to illustrate this, the calculation of the life years of lost productivity due to alcoholic cardiomyopathy is presented (Table 23).

Table 23: Calculation of years of life lost due to alcoholic cardiomyopathy

age at death	number of deaths	years of life lost/death	total years of life lost
48	3	17	51
52	1	13	13
53	2	12	24
58	4	7	28
63	1	2	2
64	1	1	1
Total	**12**		**119**

Source: Federal Public Service Economy, 2012

There were 12 deaths due to alcoholic cardiomyopathy accounting for 119 years of life lost (YLL) up to the age of 65. Since we wanted to estimate the costs of lost productivity from premature mortality, the

[36] Data related to the number of deaths per ICD-10 diagnosis for the year 2012 was obtained in writing from Statistics Belgium on 12/05/2015 (excel-file)

calculated years of life lost were multiplied with a mean employment rate in Belgium for the year 2012 being 61.8%[37] [38].

Second, substance-attributable fractions had to be applied to account for the proportion of YLL attributable to substance (mis)use. This occurred by calculating average SAFs/ICD-9 diagnosis (Appendix 9a-c) using the age- and sex-specific SAFs (Appendix 3a-c). For those ICD-9 diagnoses that could be fully attributed to substance (mis)use, no average SAFs were calculated since for these diseases the SAF was equal to one.

Third, the calculated substance-attributable years of life lost had to be multiplied with an annual mean labour cost for the year 2012 being 49,156 euros[39]. The annual mean labour cost for the reference year 2012 was halved assuming that some premature mortality cases occurred at the beginning of the year and others at the end.

So, the substance-attributable costs associated with productivity loss due to premature mortality were calculated as follows (Formula 12):

$$Attributable\ cost = SAF_{age\text{- and sex-specific}} * YLL_{disease\text{-specific}} * annual\ labour\ cost * mean\ employment\ rate$$

1.3.3. Intangible costs

The non-financial substance-attributable welfare costs were estimated using the concept of 'disability-adjusted life years' (DALYs). DALYs are a measure to quantify disease burden taking into account losses of health life years through living with a disease (years lived with a disease – YLD) and/or through dying before a reference life expectancy (years of life lost – YLL). The YLD are calculated by multiplying the time living with a disease or condition by a disability weight associated with the disease or condition[40]. Disability weights measure the degree of impact of a disease or condition and vary between zero (no disability) and one (death). The YLL are calculated by multiplying the number of deaths with the life expectancy at the age of death (Devleesschauwer et al., 2014; Drummond et al., 2005).

DALYs are then calculated as follows:

$$DALY = YLD + YLL$$

[37] This information was derived from the Federal Public Service Economy website on 12/05/2015 http://economie.fgov.be/nl/modules/publications/statistiques/arbeidsmarkt_levensomstandigheden/belgische_arbeidsmarkt_1983-2014.jsp. In the SWOT-analysis, age group-specific employment rates being 25.30% in those aged 15-24 years, 79.30% in those aged 25-54 years, and 39.50% in those aged 55-64 years will be applied

[38] The employment rate of 61.8% is probably an overestimation of the reality because no correction is applied accounting for a higher proportion of unemployment among substance users. Suggestions from the Steering Committee?

[39] This information was derived from the FPS Economy website on 12/05/2015

[40] No disease-specific DALYs were available for acute pancreatitis, cardiac dysrhythmia, cholelithiasis, heart failure, laryngeal cancer, oesophageal varices, psoriasis, respiratory tuberculosis, urinary tract cancer, pulmonary heart disease, atherosclerosis, subacute & acute endocarditis. So, these diseases are not included in the substance-attributable DALY calculation.

Data on age- and sex-specific DALYs for Belgium were derived from the World Health Organization (WHO) global burden of disease DALY estimates for the year 2012[41]. This database contains sex- and age band (0-4, 5-14, 15-29, 30-59, 60-69, ≥70 years)-specific DALYs for a number of diseases and conditions. The number of age band specific DALYs was recalculated to correspond with the age bands used for the different substances in our study. We assumed equal number of DALYs per five year age-bands. We demonstrate the calculation in an example for males aged 40-59 years suffering from pancreas cancer. The number of DALYs due to pancreas cancer in males aged 30-59 was 4,500. The age-band 30-59 years consists of six 5-year age-bands (30-34, 35-39, 40-44, 45-49, 50-54, and 55-59). So, we assumed 750 DALYs (4,500/6) per 5 year age-band. For SOCOST, the age-band considered was 40-59 years (=four 5-year age bands). So, the number of DALYs due to pancreas cancer in males aged 40-59 years was calculated as 750 DALYs * 4 = 3,000 DALYs.

To quantify the substance-attributable number of DALYs for those diseases that were found to be associated with substance mis(use) (Appendix 1a-d), the calculated SAFs were used (Appendix 3a-c). The number of DALYs that could be attributed to substance (mis)use were then calculated as follows (Formula 13):

$$Attributable\ DALYs = SAF_{age\text{-}, sex\text{-}, and\ disease\text{-}specific} * DALYs_{age\text{-}, sex\text{-}, and\ disease\text{-}specific}$$

For example, the calculated SAF for HIV-disease in females associated with illicit drugs aged 20-39 years was 0.03 (Appendix 3C) and the number of DALYs associated with illicit drugs was 315:

*Attributable DALYs= 0.03 * 315 DALYs = 9.9 DALYs*

So, HIV disease in females aged 20-39 years was responsible for 9.9 DALYs due to illicit drug use.
As a last step in the calculation process of the substance-attributable intangible costs, a monetary valuation of DALYs had to be accounted for. One DALY was valued with 40,000 euros as found by a large research project aimed at obtaining a more reliable and credible number for the value of a life year lost by air pollution mortality. The value of 40,000 euros was determined using a questionnaire in nine European countries (France, Spain, UK, Denmark, Germany, Switzerland, Czech Republic, Hungary, and Poland) accounting for a sample size of 1,463 (Desaigues et al., 2006). The substance-attributable intangible costs were then calculated as follows (Formula 14):

$$Attributable\ cost = attributable\ DALYs_{age\text{-}, sex\text{-}, and\ disease\text{-}specific} * unit\ cost$$

For example, there were 17,000 substance-attributable DALYs in males aged 40-59 years suffering from rectal cancer due to alcohol (mis)use resulting in:

*Attributable cost= 17,000 * 40,000 euros/DALY= 6,946,100 euros*

[41] This information was derived from the World Health Organization website on 14/03/2015 http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html

1.4. Beneficial effects of alcohol

Besides it harmful effects, alcohol consumption may have some preventive health effects for certain diseases. As can be identified from Appendix 3a, preventive health effects related to alcohol consumption were found (expressed as 'negative' SAFs) for diseases 'ischemic heart disease', 'ischemic stroke', 'hemorrhagic stroke' (only in females), 'cholelithiasis', and 'diabetes mellitus'. The influence of these beneficial effects on the social costs of alcohol (mis)use will not be accounted for in the overall cost calculation. These will be reported in a separate section as literature is not univocal in this (Fillmore, Kerr, Stockwell, Chikritzhs, & Bostrom, 2006; Papadakis, Ganotakis, & Mikhailidis, 2000).

2. RESULTS

2.1. DIRECT COSTS

2.1.1. Inpatient care

2.1.1.1. Hospitalisation[42]

a) General hospitals

The total hospitalisation costs for substance-attributable hospital care episodes in general hospitals (including inpatient care and hospital day care) were estimated to be 770,354,045 euros (Table 24). The majority of these costs were due to inpatient hospital care (764,820,845 euros). About two-thirds (64.0%) of the overall costs were due to tobacco-associated diseases or conditions (Table 24). Inpatient hospital costs due to tobacco-attributable diseases accounted for 64.0% of the total costs (490 million euros), followed by alcohol with 244 million euros (31.8%). Similar figures were observed for hospital day care substance-attributable costs (Table 24).

Table 24: Substance-attributable hospitalisation (inpatient & day care) costs /substance in general hospitals, 2012

substance	inpatient care		hospital day care		overall total	
	costs (euros)	proportion	costs (euros)	proportion	costs (euros)	proportion
alcohol	243,556,053	31.8%	2,188,797	39.6%	245,744,850	31.9%
tobacco	489,527,585	64.0%	3,237,352	58.5%	492,764,937	64.0%
illicit drugs	9,471,774	1.2%	57,106	1.0%	9,528,880	1.2%
psych. medication	22,265,433	2.9%	49,945	0.9%	22,315,378	2.9%
Total	**764,820,845**	**100.0%**	**5,533,200**		**770,354,045**	**100.0%**

Taking the substance-attributable expenditures for all substances into account, circulatory diseases were the main cost driver (41.31%), followed by respiratory diseases (21.69%) and neoplasms (16.23%) (Table 25).

Table 25: Substance-attributable hospitalisation (general hospitals) costs/disease group, 2012

disease/condition	costs (euros)	proportion
circulatory disorders	318,213,543	41.31%
respiratory diseases	167,113,665	21.69%
Neoplasms	125,057,209	16.23%
mental disorders	67,370,090	8.75%

[42] In the scenario analysis in the SWOT-analysis, costs will be reported accounting for a distinction between 'co-payment' and 'health insurance expenditures'

digestive disorders	53,923,403	7.00%
injury & poisoning	21,112,350	2.74%
neurological disorders	14,989,838	1.95%
infectious diseases	2,271,399	0.29%
disorders of the skin	291,140	0.04%
perinatal disorders	11,406	0.00%
total	770,354,045	100.0%

In Table 26, an overview of the distribution of the expenditures over the different diseases and conditions/substance is provided.

Table 26: Substance-attributable hospitalisation (general hospitals) disease group-specific costs, 2012

disease/condition	costs (euros)	proportion
ALCOHOL		
Neoplasms	28,936,916	11.8%
mental disorders	59,767,453	24.3%
neurological disorders	14,989,838	6.1%
circulatory disorders	87,831,959	35.7%
digestive disorders	53,923,403	21.9%
disorders of the skin	291,140	0.1%
perinatal diseases	4,141	0.0%
Total	245,744,850	100.0%
TOBACCO		
respiratory diseases	167,113,665	33.9%
Neoplasms	96,120,293	19.5%
ciculatory diseases	229,511,136	46.6%
toxic effect nicotine	19,843	0.0%
Total	492,764,937	100.0%
ILLICIT DRUGS		
infectious diseases	2,271,399	23.8%
injury & poisoning	344,089	3.6%
mental disorders	6,035,678	63.3%
circulatory diseases	870,449	9.1%
perinatal diseases	7,265	0.1%
Total	9,528,880	100.0%
PSYCHOACTIVE PHARMACEUTICALS		
injury & poisoning	20,748,418	93.0%
mental disorders	1,566,960	7.0%
Total	22,315,378	100.0%

b) Psychiatric hospitals

The substance-attributable costs associated with psychiatric hospital admissions included hospital care episodes in inpatient psychiatric hospitals and in psychiatric wards in general hospitals. The total costs associated with substance (mis)use were 476,754,851 euros and 219,787,446 euros in psychiatric hospitals and psychiatric wards in general hospitals respectively (Table 27).

Table 27: Substance-attributable hospitalisation costs /substance in psychiatric hospitals, 2012

Substance	psychiatric hospital		psychiatric ward in general hospital		overall total	
	costs (euros)	proportion	costs (euros)	proportion	costs (euros)	proportion
Alcohol	329,757,278	69.2%	168,275,331	76.6%	498,032,609	71.50%
Tobacco	3,848,473	0.8%	3,483,327	1.6%	7,331,800	1.05%
illicit drugs	58,610,201	12.3%	15,516,045	7.1%	74,126,246	10.64%
psychoactive medication	34,765,013	7.3%	23,748,130	10.8%	58,513,143	8.40%
Polysubstance	49,773,886	10.4%	8,764,613	4.0%	58,538,499	8.40%
Total	**476,754,851**		**219,787,446**		**696,542,297**	**100.00%**

The majority of the costs, 498 million euros (69.2% of the psychiatric hospital costs and 76.6% of the psychiatric ward in general hospitals costs), were associated with hospital admissions because of alcohol-related mental disorders. More than 58 million euros, 10.4% and 4.0% of the expenditures in psychiatric hospitals and psychiatric wards in general hospitals respectively, were associated with multiple substance use (Table 27).

2.1.1.3. Sheltered housing and psychiatric nursing homes

The total estimated costs attributable to substance (mis)use in sheltered housing and psychiatric nursing homes were 5,591,589 euros and 7,529,805 euros respectively. The majority of the costs were due to alcohol (68.2% in sheltered housing and 72.8% in psychiatric nursing homes). Similar to the substance-attributable costs in psychiatric hospitals, a fraction of the costs were associated with multiple substance use (10.8% in sheltered housing and 15.5% in psychiatric nursing homes) (Table 28).

Table 28: Substance-attributable expenditures for sheltered housing and psychiatric nursing homes, 2012

Substance	sheltered housing		psychiatric nursing home	
	costs (euros)	proportion	costs (euros)	proportion
Alcohol	3,814,635	68.2%	5,483,377	72.8%
Tobacco	32,089	0.6%	131,181	1.7%
illicit drugs	810,259	14.5%	367,308	4.9%
psychoactive medication	332,928	6.0%	380,426	5.1%
poly substance	601,677	10.8%	1,167,513	15.5%
Total	**5,591,589**	**100.0%**	**7,529,805**	**100.0%**

2.1.1.4. Inpatient rehabilitation

Crisis intervention centres and therapeutic communities

The Belgian National Health Insurance Institute (RIZIV-INAMI) subsidises institutions (day centres, crisis intervention centres, medical-social care centres and therapeutic communities) with the convention "rehabilitation for addicts". The institutions receive a reimbursement of medical services based on the number of treated clients who meet the conditions of reimbursement. The Belgian National Health Insurance Institute (RIZIV-INAMI) subsidises crisis intervention centres and therapeutic communities with this convention.[43] In 2012, the total expenditures for crisis intervention centres and therapeutic communities were 9,542,713 euros and 23,447,966 euros respectively. The cost across type of substance is estimated using information from the TDI (Table 29).

Table 29: Overview expenditures crisis intervention centres and therapeutic communities, 2012

Substance	crisis intervention centres			therapeutic communities		
	treatment episodes	proportion	cost	treatment episodes	proportion	Cost
Alcohol	54	5.26%	501,759	234	34.21%	8,021,672
illicit drugs	936	91.14%	8,697,157	425	62.13%	14,569,277
psychoactive pharmaceuticals	37	3.60%	343,798	25	3.65%	857,016
Total	**1,027**	**100.00%**	**9,542,713**	**684**	**100.00%**	**23,447,966**

Short-term residential programme for drug abusing minors

The treatment centre "De Sleutel" received 396,700 euros by the Fund of Youth Welfare (Fonds Jongerenwelzijn) for a short-term residential programme for drug abusing minors (Residentieel Kortdurend Jongerenprogramma – RKJ).[44]

2.1.1.5. Specific projects

Pilot projects FPS Health

In the year 2012, the FPS Health, Food Chain, and Environment subsidised five national pilot project on drug treatment. The projects "crisis and case management for persons with substance use disorders" and "treatment for clients with dual diagnosis" could be attributed to the category of inpatient care. An amount of 4,386,999 euros was spent on these two projects, this cost could not be classified according to the type of substance.

The first project with crisis units and case management cost 3,469,023 euros. Nine centers in Belgium devote four crisis beds (six in Brussels and Antwerp) to the treatment of substance related disorders and each centre treats at least 300 patients annually. This project plans an intensive short term (5 days

[43] In 2012, the province of Limburg did also support Katarsis (residential centre with a therapeutic community) with a budget of 21,100 euros.
[44] This information was provided in writing by the FLEMISH GOVERNMENT, Youth Welfare Agency, 12/11/2014.

maximum) treatment where the crisis situation due to substance problems can be analysed to start with the healing process. After consultation with the patient, the case manager refers the patient to other ambulatory or residential care settings.

The second project costs 917,976 euros and this budget has been used to finance two double diagnosis units (Psychiatrisch Centrum of Sleidinge and Intercommunale deSoins spécialisées de Liège). The aim of this project is to provide intensive and integrated treatment of patients with double diagnosis.

Projects : Federal addiction fund

The Federal Addiction Fund annually supports innovative pilot projects to stimulate the development of a broad range of treatment facilities. The annual budget of this fund is approximately 5 million euros (2 million euros for tobacco and 3 million euros for addictions). In 2012, the addiction fund financed a total of 40 projects for addictions (2,843,712 euros) and 13 projects for tobacco (1,957,910 euros). Given the various objectives of these projects, the costs have been attributed to different cost categories. In 2012, the Federal Addiction Fund supported six projects in residential care centres: two projects are related to alcohol (182,788 euros), two projects to addiction in general (254,500 euros) and two to tobacco cessation[45] (220,169 euros). In addition, one project of the Federal Addiction Fund could be attributed to the category of emergency services (79,630 euros).[46] Table 30 presents the addiction fund projects organized in residential care centres.

Table 30: Federal addiction fund –projects inpatient care, 2012

Organization	Project	Substances
CHU BRUGMANN	Evaluation, prise en charge et soutien à la prise en charge des adolescents souffrant d'une assuétude: approche familiale multi dimensionnelle	multiple substances
Interstices CHU St Pierre	Projet Liaison Alcools	alcohol
PZ Sint Camillus	Projectvoorstel intensieve outreach voor het opvolgen van personen met een alcoholafhankelijkheid	alcohol
HOPITAL NEURO_PSY SAINT MARTIN	prise en charge globale et intégrée à visée de réinsertion de jeunes adultes présentant un double diagnostic d'assuétudes et de comorbidités psychiatriques	multiple substances
Sint Kamillus	Usage de tabac chez les patients en psychiatrie	tobacco
BELTA	sensibilisation et la formation des professionnels de santé en institutions psychiatriques	tobacco
IDA	Intervention spécifique sur les problèmes d'alcool dans les services des urgences	alcohol

[45] These projects organized tobacco cessation in psychiatry (e.g. Sint Kamillus).
[46] This information was provided in writing by the SPF Health, 15/10/2014.

2.1.2. Outpatient care

2.1.2.1. Physician contacts

The substance-attributable expenditures for physician contacts included contacts with GPs, psychiatrists, and medical specialists (other than psychiatrists). The total expenditures for the three groups were 282,285,356 euros (data not included in Table 27). Only for psychiatrists, an estimation of the expenditures related to polysubstance use was possible. For GPs and medical specialists, the majority of the expenditures were associated with tobacco (58.48%), while for psychiatrists this was alcohol (69.83%) (Table 31).

Table 31: Substance-attributable expenditures associated with physician contacts, 2012

substance	GPs		psychiatrists		medical specialists	
	costs (euros)	proportion	costs (euros)	proportion	costs (euros)	proportion
alcohol	52,428,074	34.39%	12,783,113	69.83%	38,348,869	34.39%
tobacco	89,158,133	58.48%	106,960	0.58%	65,215,320	58.48%
illicit drugs	2,048,743	1.34%	1,976,068	10.79%	1,498,567	1.34%
psychoactive medication	8,826,019	5.79%	1,910,405	10.44%	6,455,851	5.79%
polysubstance			1,529,233	8.35%		
Total	**152,460,970**	**100.00%**	**18,305,779**	**100.00%**	**111,518,608**	**100.00%**

GP, general practitioner

General practitioner and certified tobaccologists: tobacco cessation

The National Institute for Sickness and Invalidity Insurance (RIZIV/INAMI) reimburses tobacco cessation by a general practitioner or certified tobaccologist. The Royal Order of 31 August 2009 foresees a reimbursement of 30 euros for the first session and 20 euros for the following sessions, with a maximum of 8 sessions (pregnant women receive 30 euros for each session). In the year 2012, the reimbursement of tobacco cessation resulted in a cost of 859.000 euros.[47]

Furthermore, FARES (Fonds des Affections Respiratoires) and VRGT (Vlaamse vereniging voor respiratoire gezondheidszorg en tuberculosebestrijding) organise the postgraduate education for tobaccology. In 2011-2012, 103 health workers participated at this training course. Since 2009, the SPF Health, with the means of the Cancer plan, supports this training with a yearly budget of 65,000 euros.[48]

[47] RIZIV, Statistieken van de geneeskundige verzorging, 2013. http://www.riziv.fgov.be/SiteCollectionDocuments/statistieken_geneeskundige_verzorging_2013.pdf

[48] SPF HEALTH, Het Kankerplan – Stand van zaken, 2014. http://www.e-cancer.be/publications/Documents/State%20of%20Affairs/2014_SVZ_Kankerplan_NL.pdf

Primary care centres

The total expenditures for primary care centres ('wijkgezondheidscentra'/'maisons médicales') in 2012 were 92,803,000 euros (RIZIV, 2013b). As a proxy for the estimation of the substance-attributable expenditures, we applied a weighted average SAF of 0.22 as used for the estimation of the substance-attributable expenditures for GPs. This resulted in an estimated substance-attributable cost of 20,416,660 euros. This is probably an underestimation of the substance-attributable expenditures, in view of the patients reached by primary care centres.

2.1.2.2. Day centres, medical-social centres and mental health care centres

Day centres and medical-social care centres

The Belgian National Health Insurance Institute (RIZIV-INAMI) also subsidises day centres and medical-social care centres with the convention "rehabilitation for addicts". For outpatient care, the day centres (DC) received 8,225,347 euros and the medical-social care centres (MSOC-MASS) received 8,947,553 euros in the year 2012.[49] The TDI data of these institutions is used in order to estimate the costs across type of drugs. The Belgian Monitoring Centre for Drugs and Drug Addiction (BMCDDA) provided the number of drug treatment episodes for each type of treatment centre during the calendar year 2012.[50] Table 32 presents the number of drug treatment episodes, the proportion and costs relating to each type of substance.

Table 32: Overview expenditures day centres and medical-social care centres, 2012

Substance	day centres			medical-social care centres		
	treatment episodes	proportion	cost (euros)	treatment episodes	proportion	cost (euros)
Alcohol	195	6.59%	541,690	68	3.96%	354,565
illicit drugs	2,723	91.96%	7,564,208	1,607	93.65%	8,379,206
psychoactive pharmaceuticals	43	1.45%	119,449	41	2.39%	213,782
Total	**2,961**	**100.00%**	**8,225,347**	**1,716**	**100.00%**	**8,947,553**

These medical-social care centres might also receive funding of provinces and/or cities. The MSOC Oostende (for the unit in Kortrijk – Roeselare) received a funding of the province West-Vlaanderen (110,000 euros) and the cities Kortrijk and Roeselare (each 5,825 euros).[51] The province Oost-Vlaanderen paid 31,300 euros for the medical-social care units in Aalst, Lokeren-Zele and Sint-Niklaas.[52]

Mental health care centres

A mental health care centre (MHCC) is an ambulatory service that provides help to people with mental problems. In the Flemish region, there are 20 mental health care centres, known as Centra Geestelijke

[49] This information was provided in writing by the NHII, Direction of care institutions and services, 19/11/2014. The envelopes across type of institution are based on the index of 1 December 2012.
[50] This information was provided in writing by the BMCDDA, 01/04/2015.
[51] This information was provided in writing by the province West-Vlaanderen, 14/01/2015.
[52] This information was provided in writing by the province Oost-Vlaanderen, 12/01/2015.

Gezondheidszorg – CGG, recognised by the Flemish Care and Health Agency and they received 61,753,798 euros in the year 2012 (including the wages of the prevention workers).[53] These MHCCs register the duration of (offered and cancelled) activities in order to measure and monitor the performance. Table 33 presents the proportion (based on the duration of offered activities[54]) and costs related to substance misuse.

Table 33: Overview expenditures mental health care centres – Flemish region: CGG, 2012

substance	mental health care centres		
	duration of activities (minutes)	proportion	cost (euros)
Alcohol	2,992,246	8.59%	5,176,495
illicit drugs	1,042,584	2.99%	1,801,830
psychoactive pharmaceuticals	88,920	0.26%	156,681
Tobacco	1,895	0.005%	3,013
Total	**2,961**	**11.85%**	**7,138,019**

In the Walloon Region, the mental health centres, known as Service Santé Mentale – SSM, received 27,927,441 euros in the year 2012. A fraction of this budget, 619,989 euros, has been used for seven mental health centres specialised in addiction (in accordance with the addiction decree 25 June 2009).[55]

In the Brussels-capital Region, the French Community Commission (COCOF) and the Common Community Commission (CoCom) also fund the ambulatory mental health centres (Service Santé Mentale – SSM) that provide psychiatric, psychological, psychotherapeutic and psycho-social treatment for mental illness. In 2012, 23 organizations received 13,645,415 euros of the COCOF.[56] The cost of the two mental health centres Free Clinic and Primavera (778,529 euros) is taken into account since these centres mainly focused on substance misuse. For the other 21 organizations, no costs can be calculated due to lack of data for the substance attributable fraction.
The German-speaking Community funds one socio-psychological centre (Sozial-Psychologisches Zentrum - SPZ). In 2012, this centre used approximately 212,500 euros for the treatment of substance misuse.[57]

The costs for these mental health centres in the Walloon Region, the Brussels-capital Region and the German-speaking Community have been attributed to the category of multiple substance, since no information is available to classify the costs according to type of substance.

[53] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 26/01/2015.
[54] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 28/01/2015.
[55] This information was provided in writing by the WALLOON REGION, General Directorate of Local Authorities, Social Services and Health, 17/02/2015.
[56] This information was provided in writing by FRENCH COMMUNITY COMMISSION, Health Department, 27/10/2014.
[57] This information was provided in writing by the GERMAN SPEAKING COMMUNITY, Department of family, health and social affairs 21/11/2014.

Specialised addiction treatment centres

The Walloon region, in accordance with the Decree of 30 April 2009, subsidises specialised addiction treatment centres "Services et réseaux d'aide et de soins spécialisés en assuétudes". These outpatient care centres provide psychosocial care, therapeutic and medical treatment, reduction of risks, etc.[58] In 2012, 23 centres (e.g. RAMBO, Cap Fly, CAHO, Trempoline, etc.) received a budget of 1,069,029 euros.[59]

The French Community Commission also subsidises specialised addiction treatment centres "Services actifs en matière de toxicomanies - SAMT". The Decree of 5 March 2009 describes directions for these ambulatory services working in the areas of social work, family and health. Fifteen drug addiction facilities, including two harm reduction centres (Modus Vivendi and Dune), received a funding of 4,207,624 euros in 2012. These treatment centres focus on multiple substances, no registration system is available to classify the costs according to type of substance.

2.1.2.3. Home-based nursing care

As described in the methods-section, no data related to the number of people receiving home-based nursing care or expenditures for home-based nursing care associated with substance (mis)use were found. The total RIZIV-expenditures for home-based nursing care were 1,122,136,000 euros[60], of which 86,625,687 euros could be attributed to substance (mis)use (Table 34). The majority of the costs were associated with tobacco accounting for 58.5% of the total home-based nursing care costs. In contrast, illicit drugs were responsible for only 1.3% of the total expenditures.

Table 34: Substance-attributable expenditures for home-based nursing care, 2012

Substance	costs	proportion
Alcohol	29,788,725	34.4%
Tobacco	50,658,110	58.5%
illicit drugs	1,164,061	1.3%
psychoactive medication	5,014,792	5.8%
Total	**86,625,687**	**100.0%**

2.1.2.4. Specific projects

Medical and Social Care Centres: needle exchange programmes

Needle exchange programmes (NEP) distribute sterile injecting material and additional prevention material among intravenous illegal drug users, and recuperate used needles. In the Flemish Community, the needle exchange programme (Spuitenruil Vlaanderen) is coordinated by the Free Clinic, in

[58] http://socialsante.wallonie.be/?q=sante/soins-ambulatoires/dispositifs/assuetudes

[59] This information was provided in writing by the WALLOON REGION, General Directorate of Local Authorities, Social Services and Health, 17/02/2015. This budget can be attributed to the category of "multiple substances" since the addiction treatment centres focus on legal and illegal drugs, alcohol, tobacco and games.

[60] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

cooperation with five other coordinators of the Medical and Social Care Centres - MSCC (MSOC/MASS), one per province. A budget of 180,000 euros is used for provincial coordination and the MSCCs received 310,000 euros. A total cost of 490,000 euros can be attributed to the category of outpatient care.

Pilot projects FPS Health: treatment with diacetylmorphine

The city of Liege receives 111,278 euros funding of the FPS Health, Food Chain, and Environment for the pilot project "TADAM". This project aims to provide medically assisted outpatient treatment with diacetylmorphine.

Projects: Federal addiction fund

The majority of the Federal addiction fund projects focus on outpatient care: 9 projects are related to tobacco cessation (1,653,791 euros), 12 projects to addiction in general (805,348 euros), 5 projects to illegal substances (304,552 euros), 1 project (175,000 euros) is related to alcohol abuse and 1 project (78,475 euros) to abuse of medicines.[61] In addition, seven projects with home care have been financed by the Federal Addiction Fund: 1 project is related to alcohol (140,500 euros), 2 projects to illegal substances (100,994 euros) and 4 projects to addiction in general (314,838 euros).[62] Table 35 presents these home care projects.

Table 35: Federal addiction fund – home care projects, 2012

Organization	Project	Substances
CAD Limburg	alcoholhulp.be + cannabishulp.be	Multiple substances (alcohol and illicit drugs)
Ellipse	CASA : Projet d'accompagnement à domicile de personnes souffrant ou ayant souffert d'assuétude(s)	Multiple substances
KOMPAS	Crisishulp aan huis	Multiple substances
LA CAHO asbl	Implémentation d'un projet de sevrage à domicile de personnes alcoolo-dépendantes	Alcohol
Psychiatrisch Centrum OLV	Psychiatrische thuisbegeleiding voor jongeren (16-35j) met een psychotische stoornis in combinatie met middelenmisbruik (alcohol, drugs)	Multiple substances (alcohol and illicit drugs)
BOGOLAN	Projet d'accompagnement des parents usagers de drogues vers le lieu de vie de leur enfant	Illicit drugs
CAD LIMBURG - CGG KEMPEN	Online drughulp (online hulpverlening met cocaine, speed, XTC, GHB)	Illicit drugs

Projects: Special Youth Care

The Flemish Agency of Youth Welfare subsidises illegal drug projects in order to strengthen the cooperation between Special Youth Care (Bijzondere Jeugdzorg) and the local mental health care centres.

[61] This information was provided in writing by the SPF Health, 15/10/2014.
[62] This information was provided in writing by the SPF Health, 15/10/2014.

In 2012, five projects (Druglink Antwerpen, Drugslink, Keep it Clean, Link and Stuff) have been realised and each project received 80,000 euros.[63] Together this makes for a total expenditure of 400,000 euros.

Projects: Walloon plan without tobacco

For 2012-2013, the fifth plan "Without tobacco" (Plan Wallon sans tabac) has been launched by the Minister of Health of the Walloon Region. The focus of this plan lies on young smokers and vulnerable people. A budget of 156,817 euros has been distributed over 5 projects (see Table 36).[64]

Table 36: Plan without tobacco (Walloon Region) – projects outpatient care, 2012

Organization	Project	Substances
Fonds des Affections Respiratoires - FARES	Formation continuée en Tabacologie	Tobacco
Département de Médecine Générale de l'Université de Liège - DUMG ULG	Modules de formation concernant l'accompagnement du fumeur (entretien motivationnel) à destination des médecins en DES de Médecine Générale des 3 Universités (ULB, UCL, ULg)	Tobacco
Société Scientifique de Médecine Générale – SSMG	Soutien aux médecins généralistes francophones dans l'aide au sevrage tabagique de leurs patients	Tobacco
Service d'Etude et de Prévention du Tabagisme – Sept	Aide aux fumeurs et mise en projet des publics fragilisés	Tobacco
Fédération des maisons médicales - FMM	Accompagnement des patients fumeurs en maison médicale	Tobacco

Projects : Walloon Region

The Walloon Region funds projects in order to strengthen the outpatient care of addictions. These non-recurrent subsides could be retrieved in the budget "Subventions aux organismes d'étude, d'expérimentation et d'actions en santé mentale, en toxicomanie et en circuits de soins". In 2012, 16 organisations (e.g. Destination, SESAME, Modus Vivendi) received a budget of 512,547 euros.[65]

Moreover, the Walloon Region provides funding in the framework of the 3rd strategic plan "Plan Stratégique transversal – Inclusion sociale" . An additional budget of 750,431 euros have been used to fund 17 projects. These projects focus on multiple substances, therefore it is not possible to classify these costs according to type of substance.

[63] This information was provided in writing by the FLEMISH GOVERNMENT, Youth Welfare Agency, 12/11/2014.
[64] This information was provided in writing by the WALLOON REGION, General Directorate of Local Authorities, Social Services and Health, 05/12/2015.
[65] This information was provided in writing by the WALLOON REGION, General Directorate of Local Authorities, Social Services and Health, 17/02/2015.
This budget has been attributed to the category of outpatient care, nevertheless it is possible that expenditures of a number of projects belong to other categories (e.g. social work services or coordination). A list with the name and the goal of these projects could not be provided by the General directorate of local authorities, social services and health.

Projects: Walloon Social Cohesion Plan

The Social Cohesion Plan for cities and towns in Wallonia aims to support municipalities who committed to promote social cohesion. In 2012, the Walloon Regional Government allocated a budget of 31.6 million to 1,681 actions, of which 92 actions[66] with a cost of 1,709,530 euros were related to substance misuse.[67] Multiple projects have been financed with a focus on prevention, outpatient care, social work, coordination or other (research). It is estimated that 445,190 euros can be attributed to outpatient care since 25 projects (26.04%) organized ambulant care for substance abusers. These projects were mainly restricted to harm reduction interventions such as needle exchange and substitution treatment.

Projects: COCOF health initiatives

The French Community Commission (COCOF) finances health projects “initiatives en matière de la santé”, amongst others, the project smoking cessation in vulnerable groups. The "ASBL Fédération des maisons médicales et collectifs de santé francophones" received 29,167 euros for this tobacco project.[68]

Support centres for smokers (Centre d’aide aux fumeurs)

The provincial centre d’aide aux fumeurs (CAF) helps people to stop smoking with a psychologist/tobaccologist, therefore it receives funding of the province Liège. In 2012, a budget of 44,840 euros have been attributed to this CAF. [69]

Projects: provincial initiatives

The treatment centre “De Sleutel“ (region Veurne-Diskmuide) received 15,000 euros by the province West-Vlaanderen.[70] The province Limburg reports a cost of 74,570 euros for CAD Limburg and 20,000 euros for the early intervention project of Katarsis and CAD Limburg. Furthermore, the province Oost-Vlaanderen attributed a budget of 25,000 euros to the organization “De eenmaking” for substance misuse treatment of immigrants.

[66] 92 actions for substance misuse are registered, nevertheless 96 objectives have been identified. Only a minority of these projects (approximately 13%) focus on one type of substance, therefore the costs of the social cohesion plan are distributed to the category of multiple substances.

[67] This information was provided in writing by the WALLOON REGION, Interdepartmental Directorate of Social Cohesion, 27/10/2014.

[68] This information was provided in writing by FRENCH COMMUNITY COMMISSION, Health Department, 28/10/2014.

[69] This information was provided in writing by the province Liège, 26/03/2015.

[70] This information was provided in writing by the province West-Vlaanderen, 14/01/2015.

2.1.3. Social work services

2.1.3.1. General Welfare Centres

The General Welfare Centres (Centra Algemeen Welzijnswerk – CAW) in the Flemish part of Belgium provide 'first line care' to those with mental health problems, domestic violence victimisation or perpetration, alcohol and illicit drug problems and other social care issues. These 25 General Welfare Centres received 76,796,121 euros of the Flemish government in 2012.[71] Moreover, a total of 150,594 contacts with patients were recorded in the same year (110,420 first contacts and 40,174 contacts for systematic treatment) and 4,914 of these contacts (4.80%) are related to addiction problems.[72] Together this implies a 3,686,214 euros expenditure for the General Welfare Centres that can be substance misuse attributed for 2012.[73]

2.1.3.2. Telephonic and online support

"Tele-onthaal" is a Flemish volunteer-based organization, which provides telephonic and online support for people in distress. In 2012, this Telephonic Emergency Service registered 70,718 telephone calls and 5,261 online conversations. A total of 121,035 topics have been discussed during these calls and conversations, of which 3.23% is related to dependency. When applying this fraction on the total budget of 2,388,758 euros[74], a substance attributable expenditure of 77,129 euros (73,774 euros for telephonic support and 3,355 euros for online support) can be noted. Table 37 presents the fractions and costs of telephonic and online support related to substance misuse .

Table 37 : Overview expenditures "tele-onthaal", 2012

Substance	telephonic support		
	number of topics	proportion	cost (euros)
Alcohol	2,510	2.07%	49,538
illicit drugs	798	0.66%	15,749
psychoactive pharmaceuticals	430	0.36%	8,487
	Online support		
	number of topics	proportion	cost (euros)
dependency[75]	170	0.14%	3,355
Total		**3.23%**	**77,129**

[71] This information was provided in writing by the FLEMISH GOVERNMENT, Department of Wellbeing, Public Health and Family, 02/03/2015.
[72] This information was provided in writing by the Centre for General Welfare Work (Steunpunt Algemeen Welzijnswerk - SAW), 18/11/2014.
It was not possible to obtain the number of contacts for each substance separately, since many addiction problems are not specified.
[73] This cost for the general welfare centres is possibly an underestimation (in 2013: approximately 70% was paid with the "enveloppefinanciering" of the Flemish government). The general welfare centres also receive funding of other authorities such as the federal, local and provincial government. These costs have not been taken into account, since no overview of the funding is available for the year 2012.
[74] This information was provided in writing by the FLEMISH GOVERNMENT, Department of Wellbeing, Public Health and Family, 02/03/2015.
[75] For the online consultations, there are no data available for each substance separately.

"Télé-accueil" is the Telephonic Emergency Service financed by the Walloon Region. In 2012, the six telephone centres received 1,069,276 euros.[76] The substance attributable cost is limited to 16,574 euros since 1.55% of the 165,285 calls was related to alcohol, illicit drugs and psychoactive pharmaceuticals. The annual figures for "télé accueil" are presented in Table 38.[77]

Table 38: Overview expenditures "télé accueil", 2012

Substance	telephonic support		
	number of topics	proportion	cost
alcohol	1,680	1.02%	10,907
illicit drugs	397	0.24%	2,566
psychoactive pharmaceuticals	478	0.29%	3,101
Total		**1.55%**	**16,574**

2.1.3.3. Specific projects

Projects: Aftercare programme PPS Social Integration

The PPS Social Integration, Anti-Poverty Policy, Social Economy and Federal Urban Policy finances aftercare programmes for substance abusers. In 2012, 6 projects have been financed with a budget of 601,000 euros[78], Table 39 gives an overview.

Table 39: Overview expenditures PPS Social Integration, 2012

Organization	Local Authority	Focus	Budget 2012 (Euro)
Sociale Werkplaats De Sleutel project perspectief	Gent	Illegal drugs	196,875
OCMW Gent project perspectief	Gent	Illegal drugs	53,125
Phenix asbl	Jambes	multiple substances	250,000
Dune asbl	Brussel	Illegal drugs	58,500
Trempoline asbl	Châtelet	multiple substances	22,500
Article XXIII asbl	Luik	multiple substances	20,000
Total			**601,000**

Projects: Federal addiction fund

In 2012, one project of the Federal Addiction Fund could be attributed to the category of social work services. The public welfare centre (OCMW/CPAS) of Antwerp received 49,250 euros in order to reconnect substance misusers with the health care network and the society.[79]

[76] This information was provided in writing by the WALLOON REGION, General Directorate of Local Authorities, Social Services and Health, 17/02/2015.
[77] In 2012, Télé accueil also registered 1,127 calls for other types of dependency.
[78] This information was provided in writing by the PPS Social Integration, 22/10/2014.
[79] This information was provided in writing by the SPF Health, 15/10/2014.

Projects: Walloon Social Cohesion Plan

The Walloon Regional Government financed, with a budget of 1,709,530 euros in 2012, social cohesion projects related to substance misuse.[80] Multiple projects have been financed with a focus on prevention, outpatient care, social work, coordination or other (research). It is estimated that 391,767 euros can be attributed to social work due to 22 (22.92%) social work projects (e.g. projects of public social welfare centres, low-threshold services and street work). These projects focus on multiple substances, therefore it is not possible to classify these costs according to type of substance.

2.1.4. Pharmaceuticals

In 2012, 55,091 patients bought pharmaceuticals in the pharmacy for substance misuse treatment, with a total cost of 10,809,289 euros. The medications used in nicotine dependence (varenicline) cost 4,162,471 euros, the pharmaceuticals used in alcohol dependence (acamprosate and disulfiram) cost 2,016,596 euros and the medications used in opioid dependence (buprenorphine and methadone) cost 4,630,220 euros.[81] This cost is probably an overestimation, since these pharmaceuticals have not been exclusively used to treat substance abuse and dependency. It is possible that a fraction of these pharmaceuticals have been sold to treat other diseases and conditions such as pain control.[82] Table 40 presents the number of packages/modules dispensed, amount of the insurance contribution (RIZIV/INAMI) and amount of the co-payment by the patient.

Table 40: Overview expenditures pharmaceuticals, 2012

Pharmaceutical	Number of packages	Cost insurance (euros)	Cost patient (euros)	Total cost (euros)
Varenicline	21,024	3,879,819	282,652	4,162,471
Acamprosate	43,345	1,440,465	557,842	1,998,307
Buprenorfine	20,921	320,047	83,786	403,833
Buprenorfine, combination	14,096	691,625	110,692	802,317
	Number of modules	**Cost insurance (euros)**	**Cost patient (euros)**	**Total cost (euros)**
Disulfiram	5,219	14,249	4,040	18,289
Methadone	785,236	2,839,274	584,796	3,424,070
Total	**/**	**9,185,480**	**1,623,809**	**10,809,289**

[80] This information was provided in writing by the WALLOON REGION, Interdepartmental Directorate of Social Cohesion, 27/10/2014.
[81] This information was provided in writing by the RIZIV, Farmanet/Pharmanet, 10/06/2015.
[82] This information was provided in writing by the RIZIV, Farmanet/Pharmanet, 08/06/2015.

2.1.5. Prevention

2.1.5.2. Initiatives aimed at health promotion

Association of General Practitioners (Domus medica)

Domus Medica is the Flemish association of general practitioners and they provide expertise on preventive health care. The Flemish Government financially supports this organization, a budget of 23,650 euros has been used for prevention of alcohol, tobacco and illegal drugs (including labour cost of 20,000 euros for the coordinator). Furthermore, a budget of 3,000 euros can be attributed to tobacco prevention and 11,317 euros to alcohol prevention.[83]

Prevention workers at the mental health care centres (CGG)

The mental health care centres (CGG) also focus on prevention with the employment of alcohol and illicit drug prevention workers. In 2012, 21.94 FTE prevention workers were financed by the Flemish Government with an envelope ("enveloppefinanciering"). It is assumed that each prevention worker costs 68,000 euros, this means a total cost of 1,491,920 euros. An additional 13.48 FTE prevention workers are financed with other means (e.g. local funding, provincial funding, strategic safety and prevention plan and the association for alcohol and other drug problems), of which 6.21 FTE (422,280 euros) have not been included yet in this study.[84] This results in a total costs of 1,914,200 euros for multiple substances (since it is not possible to classify this cost according to type of substance).

Local-regional health consultation and organization (Logo)

The local-regional health consultation and organization (Logo) forms networks where they cooperate with various organizations to implement Flemish preventive health policy on a local-regional level. The Flemish Government recognises, instructs and subsidises (2012: 5,737,733 euros) the Logos. A budget of 975,415 euros is assigned to the category prevention of substance misuse, since the registration system of Logo (CIRRO) reported that 17% or the actions focus on tobacco, alcohol and illegal drugs.[85]

Flemish Institute for Health Promotion and Disease Prevention (VIGeZ)

The Flemish Institute for Health Promotion and Disease Prevention (VIGeZ) aims to promote healthy living and a healthy environment in Flanders. This institute focuses on 7 themes: breast cancer screening, health and environment, nutrition and physical activity, tobacco, accident prevention, suicide prevention and vaccinations. The Flemish government formed an agreement with VIGeZ in which subsidies and objectives were fixed. In 2012, they received 1,666,567 euros from the Flemish government, of which 238,081 euros can be attributed to tobacco prevention.[86]

[83] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014.
[84] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 26/01/2015.
[85] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014.
[86] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014. Given the fact that VIGeZ focuses on 7 themes, we took into account one seventh of the total VIGeZ budget in order to estimate the cost for tobacco prevention.

Association for addiction prevention and life skill improvement

The German-speaking Community funds the "Association for addiction prevention and life skill improvement" (Arbeitsgemeinschaft für Suchtvoreugung und Lebensbewältigung – ASL). In 2012, this centre used approximately 177,629 euros for the prevention of any type of substance misuse.[87]

Support point for schools in addiction prevention

The support point for schools in questions of prevention and addiction (point d'appui aux écoles en matière de prévention des assuétudes - PAA) is a project organised by the Local Centres for Health Promotion (Centrex locaux de promotion de la santé - CLPS)[88]. These support points play a role of interface between specialized health sectors and secondary schools, they create new collaborations and networks in order to reinforce youth' competences concerning risk-taking. In 2012, the French Community[89] funded ten support points for schools in addiction prevention (Bruxelles, Luxembourg, Verviers, Brabant wallon, Huy-Waremme, Hainaut occidental, Charleroi-Thuin, Liège, Mons-Soignies et Namur) with a budget of 219,042 euros.[90] These support points focus on multiple substances, therefore it is not possible to classify the cost according to type of substance.

2.1.5.2. Specific projects

Campaign against the abuse of sleeping pills and tranquilisers

The SPF Health organizes a campaign against the abuse of sleeping pills and tranquilisers. The aim of this campaign is to inform users about the possible consequences of inappropriate use of this psychoactive medication. The campaign gives advice about the alternatives to reduce sleep disorders, anxiety and stress. In 2012, a budget of 227,649 euros was made available for this campaign.[91]

Projects: Federal addiction fund

The national coalition against tobacco is an organization that focuses on tobacco prevention. Every year, on 31 May, they organise the World No Tobacco Day, highlighting the health risks associated with tobacco use and advocating for effective policies to reduce tobacco consumption. The addiction fund donated 46,950 euros to this project.[92]

[87] This information was provided in writing by the GERMAN SPEAKING COMMUNITY, Department of family, health and social affairs, 20/11/2014.
[88] The CLPS centres are funded by the Belgian French community to carry out health promotion activities such as dissemination of information, facilitation of partnership and consultation processes and conferences.
[89] The province of Brabant wallon also finances the CLPS (2012: 114,000 euros), however it is not possible to estimate the fraction that has been used for addiction prevention.
[90] This information was provided in writing by FRENCH COMMUNITY WALLONIA- BRUSSELS, General Directorate of Health, 03/11/2014.
[91] This information was provided in writing by the SPF Health, 15/10/2014.
[92] This information was provided in writing by the SPF Health, 21/11/2014.

Moreover, two projects (national campaign "no alcohol under 16" and the education of pharmacists to talk with patients about the use of alcohol and medicines) of the Federal Addiction Fund could be attributed to the category of alcohol prevention. Together, these projects cost 170,868 euros.[93]

Projects: Flemish action plan tobacco, alcohol and drugs

The Flemish Community disposes of an action plan on tobacco, alcohol and drugs. This plan aims to minimize the negative health impact of substance use on health, therefore it subsidises prevention projects. In 2012, six projects (see Table 41) have been financed with a total budget of 875,950 euros: 237,408 euros for illegal drugs, 255,450 euros for alcohol and 383,092 euros for tobacco.[94]

Table 41: Flemish action plan on tobacco, alcohol and drugs – prevention projects, 2012

Organization	Project	Substances
VAD	Alcohol- en drugpreventie bij kwestbare allochtonen jongeren Alcohol and drug prevention towards young people from ethnic minorities	Multiple substances (alcohol and illicit drugs)
VIGeZ	24 uur niet roken 24 hours non smoking	Tobacco
VIGeZ	Lokaal rookstopbeleid Local stop smoking policy	Tobacco
VAD	Opvoedingsondersteuning op het gebied van alcohol en drugs Parenting support for alcohol and drugs	Multiple substances (alcohol and illicit drugs)
VAD	Tobacco, alcohol and drugs during the pregnancy Tabak, alcohol en drugs en zwangerschap	Multiple substances (alcohol, tobacco and illicit drugs)
VAD	Children of parents with an alcohol problem Kinderen van ouders met alcoholproblemen (KOAP)	Alcohol

Training for school-based drug prevention programmes (De Sleutel)

"De Sleutel" is located in the Flemish region and they provide training for school-based drug prevention. Teachers are trained to implement drug prevention programmes (tobacco, alcohol and illegal drugs) in their classrooms, using the European programme "Unplugged". The Flemish Government reported an expenditure of 145,000 euros for this prevention project.[95]

Projects : addiction and HIV prevention (French Community Wallonia- Brussels)

In 2012, the French Community Wallonia- Brussels subsidised 16 addiction and HIV prevention projects. Thirteen projects have been established to prevent substance misuse, with a total budget of 1,301,567 euros.[96] A budget of 140,000 euros is attributed to tobacco prevention (Fonds des Affections Respiratoires – FARES : Prévention du tabagisme dans un cadre de promotion de la santé), 60,000 euros to alcohol (Univers Santé: jeunes et alcool) and the remaining budget of 1,101,567 euros to multiple substances.

[93] This information was provided in writing by the SPF Health, 15/10/2014.
[94] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014.
[95] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014.
[96] This information was provided in writing by FRENCH COMMUNITY WALLONIA- BRUSSELS, General Directorate of Health, 03/11/2014.

Furthermore, three projects have been identified to prevent HIV infection among illegal drugs users. The organizations Modus Vivendi, Coordination Sida Assuétudes Namur and Service Education pour la Santé received for these harm reduction projects a total budget of 523,370 euros.

Projects: Walloon Social Cohesion Plan

In 2012, the Walloon Regional Government allocated a budget of 1,709,530 euros to projects related to substance misuse.[97] These actions focus on prevention, outpatient care, social work, coordination or other (research). It is estimated that 534,228 euros can be attributed to prevention since 30 actions (31.25%) formulated an objective to prevent substance misuse. It is not possible to classify these costs according to type of substance.

Projects: COCOF health initiatives

The French Community Commission (COCOF) finances projects for health promotion: "initiatives en matière de la santé". More specifically 164,456 euros were spent on five prevention projects.[98] Table 42 presents these projects with focus on substance misuse prevention.

Table 42: COCOF projects health promotion – prevention projects, 2012

Organization	Project	Substances
ASBL Liaison Antiprohibitionniste	réflexion, d'information et de sensibilisation autour de la question de la prohibition des drogues dans notre société	Illicit drugs
ASBL Alias	projet d'actions de prévention et d'accompagnement psycho-médico-social à destination des hommes prostitués en situation de vulnérabilité	Multiple substances
ASBL Question Santé	« Santé et Entreprises » (Alcool, drogues,..)	Multiple substances
ASBL Modus Vivendi	promotion de la santé et réduction des risques en milieu festif	Multiple substances
ASBL Féderation Bruxelloise des Institutions pour Toxicomanes – FEDITO BXL	élaboration d'un plan bruxellois de réduction des risques	Multiple substances

Projects: provincial prevention initiatives

The province Luxembourg supports the organizations Vie Libre (movement of former drinkers) and APPEL (Alcoolisme, Parole, Partage et Liberté). Furthermore the health prevention service (Service Prévention Santé) of the province finances multiple projects on alcohol misuse (e.g. risk reduction projects, the

[97] This information was provided in writing by the WALLOON REGION, Interdepartmental Directorate of Social Cohesion, 27/10/2014.

[98] This information was provided in writing by French Community COMMISSION, Health Department, 27/10/2014.
Three projects of this budget "initiatives en matière de la santé" have been attributed to other cost categories: project of the "ASBL Fédération des maisons médicales et collectifs de santé francophones" to outpatient care, the budget for the General Drugs Policy Cell to the category of integrated projects and study of "Réseau d'Aide aux Toxicomanes" to research.

distribution of water and a conference). In 2012, a total budget of 19,000 euros was spent on these alcohol prevention initiatives.[99]

The province Brabant wallon organised an alcohol campaign "L'alcool, c'est pas interdit d'en parler". This campaign costs 792 euros in the year 2012.[100]

The province Liège also sets up a campaign "Faites la fête sans perdre la tête". This campaign focused on drug, alcohol and tobacco consumption at festivals and costs 5,500 euros. In 2012, multiple leaflets have been published (990 euros on alcohol, 280 euros on illicit drugs and 1,590 on addiction in general) and a pedagogic game on addiction has been developed (957 euros). Furthermore, the province reports a cost of 267,409 euros for the "point cannabis-alcool" and 3,300 euros for "Risquez Moins". Moreover, the province invests in tobacco prevention with "plan de 5 jours" (4,658 euros) and the World No Tobacco Day (9,468 euros).[101]

The province West-Vlaanderen spent approximately 7,700 euros on substance misuse prevention (e.g. educational material, leaflet, etc.) in 2012.[102]

The province Oost-Vlaanderen supports eight intercommunal prevention services with focus on illegal drugs (drugpunt SMAK, Leie & Schelde, ELZA, Rhode & Schelde, Lokeren-Zele-Berlare, INDRA, Wetteren-Wichelen-Laarne, Waas) and the CAT Preventiehuis (prevention of alcohol and illegal drugs). In 2012, the drugpunt services received a total budget of 178,464 euros and CAT Preventiehuis 59,095 euros. [103]

The province Vlaams-Brabant provided subsidies to six intercommunal organizations (153,992 euros) and prevention initiatives such as the promotion of the game "Narcopoloy" about illegal drugs (500 euros) and the theatre performances about alcohol and cannabis (15,602 euros). In addition, the province paid 42,000 euros for the training of six prevention workers at the mental health care centres CGG Vlaams Brabant Oost and CGG Ahasverus. [104]

In conclusion, the provinces spent 20,782 euros on alcohol prevention, 179,244 euros on illegal drugs, 14,126 euros on tobacco and 556,188 euros on addiction in general.

[99] This information was provided in writing by the province Luxembourg, 16/07/2015.
[100] This information was provided in writing by the province Brabant wallon, 09/06/2015.
[101] This information was provided in writing by the province Liège, 26/03/2015.
[102] This information was provided in writing by the province West-Vlaanderen, 14/01/2015.
[103] This information was provided in writing by the province Oost-Vlaanderen, 12/01/2015.
[104] This information was provided in writing by the province Vlaams-Brabant, 19/01/2015.

2.1.6. Research

Research projects funded by SPF Health

The SPF Health reports a cost of 20,000 euros for the UP TO DATE research "Use of alcohol, illegal drugs, hypnotics and tranquilizers in the Belgian population" and 16,380 euros for the DRID research "Drug-related infectious diseases and psychiatric disorders amongst injecting drug users in Belgium". Moreover, 18,000 euros is assigned to methadone substitution treatment in the federal budget of the SPF Health.[105] This budget has been used for an impact analysis, and to draw up a project plan for the registration of substitution treatment (in accordance with the Royal Order of 19 March 2004).

Treatment Demand Indicator (TDI)

FPS Health is responsible for the implementation of TDI in general and psychiatric hospitals. In 2011 the FPS Health started with the pilot project of TDI registration in 25 hospitals, in 2012 and 2013 this number is expanded to 42 general and psychiatric hospitals.[106] The SPF Health reports a cost of 273,815 euros for this TDI pilot project.[107]

Moreover, the Scientific Institute of Public Health (WIV/ISP) receives 132,554 euros of the Belgian National Health Insurance Institute (RIZIV-INAMI) for the registration of TDI.

Federal research programme Drugs of BELSPO

The research programmes department of the Belgian Federal Science Policy Office (BELSPO) manages the Federal research programme Drugs. The research projects in this programme support the «Integral and integrated policy on drugs» adopted on 25 January 2010, thereby implementing the Federal policy Note on Drugs of 2001. In 2012, BELSPO financed six research projects on substance (mis)use with a budget of 414,845 euros (see Table 43).[108]

Table 43: Federal research programme Drugs – studies on substance abuse and health, 2012

Research	Substances
POLYMEH: Poly drug use and mental health among drug users who ask for treatment	Multiple substances
DRUSEB: Drug use among female sex workers in Belgium	Multiple substances
SUBANOP: Analysis and optimization of substitution treatment in Belgium	Illicit drugs
ADAPT-YOUTH: Adapting best practice guidelines for the detection, prevention and treatment of substance abuse in children and youngsters to a local Belgian context	Multiple substances
UP TO DATE: Use of alcohol, illegal drugs, hypnotics and tranquilizers in the Belgian population	Multiple substances

[105] This information was provided in writing by the SPF Health, 15/10/2014.
[106] SPF Health, Treatment Demand Indicator. http://www.health.belgium.be/eportal/Healthcare/Specialisedcare/drugs/TreatmentDemandIndicator/19093045_NL#.VWhv8Sj9yUY
[107] This information was provided in writing by the SPF Health, 15/10/2014.
[108] This information was provided in writing by the Belgian Science Policy, 03/11/2014.

Programme Drugs of the Scientific Institute of Public Health

The main task of the Scientific Institute of Public Health (WIV-ISP) is the support of health policy using scientific research, expert advice and support. The Drugs Programme of the Scientific Institute of Public Health monitors the current drug situation and makes policy recommendations regarding illegal drugs. The Drugs Programme reports expenditures for TDI and the BMCDDA (see infra and supra), moreover a budget of 25,450 euros is used for the subcontract with Healthconnect (Early Warning System on synthetic drugs) and with Tradas (translation consultancy).

European School Survey Project on Alcohol and Other Drugs

The European School Survey Project on Alcohol and Other Drugs (Espad) is a collaborative effort of independent research teams in more than forty European countries. The main purpose of Espad is to repeatedly collect comparable data on substance use (alcohol, illicit drugs, tobacco and psychoactive medication) in Europe among 15–16 year old students, in order to monitor trends within as well as between countries.[109] Espad is funded by the Flemish government, 27,000 euros were spent on this research project.[110]

Projects: Federal addiction fund

In 2012, one research has been financed by the Federal Addiction Fund. The study about quality improvement in addiction treatment settings (alcohol, illegal drugs and psychoactive medication) has been conducted by the Association for Alcohol and other Drug problems (Vereniging voor Alcohol- en Andere Drugproblemen - VAD). This association received 46,853 euros for the project.[111]

Projects: Walloon Social Cohesion Plan

The social cohesion plan of the Walloon Regional Government reported 3 research projects on the misuse of substances (alcohol and illegal drugs). Approximately, 53,423 euros was required to fund these projects.

Projects: COCOF health initiatives

The French Community Commission (COCOF) financed a feasibility study for a partnership regarding primary care for substance misusers[112] with the budget of health promotion (initiatives en matière de la santé). More specifically, the "ASBL Réseau d'Aide aux Toxicomanes" received 20,000 euros for this research.[113] It is not possible to classify this cost according to type of substance.

Projects: provincial initiatives

In 2012, Ghent University (department of special needs education) provided scientific support for the addiction treatment process, therefore it received 5,000 euros of the province Oost-Vlaanderen.

[109] Espad, Purpose & Methodology, http://www.espad.org/en/Purpose--Methodology/

[110] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014.

[111] This information was provided in writing by the SPF Health, 15/10/2014.

[112] Etude de faisabilité pour la construction d'un partenariat visant l'élargissement de l'offre de soutien à la pratique des soins de première ligne vers les usagers de drogues et toxiques, et les patients souffrant d'addictions

[113] This information was provided in writing by FRENCH COMMUNITY COMMISSION, Health Department, 27/10/2014.

2.1.7. Coordination

BMCDDA

The Scientific Institute of Public Health (WIV/ISP) is responsible for the Belgian monitoring Center for drugs and drugs addiction (BMCDDA). The main tasks of the BMCDDA is the monitoring, collection, analysis and dissemination of illegal drug-related information. The Scientific Institute of Public Health (WIV/ISP) reports a total costs of 293,223 euros for the BMCDDA, therefore it receives a subvention of 103,173 euros from the EMCDDA and 190,050 euros from federal services.

Association for Alcohol and other Drug problems

The Association for Alcohol and other Drug problems (Vereniging voor Alcohol- en Andere Drugproblemen - VAD) co-ordinates institutions and associations active in Flanders in the field of alcohol and other drug problems (including psychoactive medication and gambling). The Association is acknowledged by the Flemish government and received 2,278,729 euros in the year 2012.[114]

Networks (COCOF)

In 2012, the French Community Commission (COCOF) financed 12 network with a budget of 573.242 euros.[115] The cost of 104,098 euros, for the networks 'Dépendance Bruxelles-Est' (multiple substances: 55,800 euros) and 'Hépatite C' (illegal drugs: 48,298 euros), is taken into account.

Pilot Project FPS Health

The FPS Health reported a pilot project on the implementation of the function of mental health care coordinator within the Mental Health Consultation Platform (zorgcoordinator overlegplatforms geestelijke gezondheidszorg) for the treatment of persons with a substance related disorder. This project cost 374,177 euros in the year 2012. It is not possible to classify this cost according to type of substance.

Projects: Federal addiction fund

In 2012, five coordination projects have been financed by the Federal Addiction Fund: one project is related to illegal substances (43,300 euros) and four projects to addiction in general (216,590 euros).[116] Table 44 presents these coordination projects.

[114] This information was provided in writing by the FLEMISH GOVERNMENT, Agency for Care and Health, 15/10/2014. The costs for the drug telephone helpline (Druglijn) are included in this budget.
[115] This information was provided in writing by FRENCH COMMUNITY COMMISSION, Health Department, 27/10/2014.
[116] This information was provided in writing by the SPF Health, 15/10/2014.

Table 44: Federal addiction fund – coordination projects

Organization	Project	Type of substance
IDA	IDA-web: uitbreding van Franstalig interactief platform voor professionelen en intermediairen	Multiple substances
Bruxelles-cannabis	Vers la formation d'un réseau spécialisé	Illegal drugs
PopovGGZ	Optimalisatie van de zorg voor mensen met een verstandelijke beperking en een verslavingsprobleem	Multiple substances
Transit Lama	Table ronde autour d'une scène ouverte	Multiple substances
VAD	Materiaalontwikkeling modulair aanbod motiverende gesprekvoering	Multiple substances

Projects: Walloon Social Cohesion Plan

In 2012, the Walloon Regional Government financed 92 social cohesion projects related to substance misuse with a budget of 1,709,530 euros.[117] For 16 projects (16.67%) the aim was to create or reinforce a network/collaboration, and these projects required a budget of approximately 284,922 euros. These projects focus on multiple substances, therefore it is not possible to classify these costs according to type of substance.

Provincial drug coordination

The province Oost-Vlaanderen supports PopovGGZ for the coordination of mental health care centres (Centra Geestelijke Gezondheidszorg – CGG) with a budget of 60,500 euros. Furthermore, the Provincial Inter-Governmental Partnership for Tackling Drug Abuse (PISAD - Provinciaal Interbestuurlijk Samenwerkingsverband voor Aanpak van Drugmisbruik) received 293,335 euros of the province. [118]

The province Vlaams-Brabant spent 1,400 euros on networking and 17,799 euros on the provincial coordinator of substance misuse. [119]

[117] This information was provided in writing by the WALLOON REGION, Interdepartmental Directorate of Social Cohesion, 27/10/2014.
[118] This information was provided in writing by the province Oost-Vlaanderen, 12/01/2015.
[119] This information was provided in writing by the province Vlaams-Brabant, 19/01/2015.

2.2. INDIRECT COSTS

2.2.1. Productivity losses from disability

The substance-attributable expenditures from disability included short-term disability ≤365 days of disability [120]) and long-term disability (>365 days of disability). There were an estimated 10,649 male and 10,755 female individuals suffering from long-term disability that could be attributed to substance (mis)use.[121] For short-term disability, these figures were 18,992 and 17,859 for men and women respectively.[122]

a) Short-term disability

The total expenditures for short-term disability that could be attributed to substance (mis)use were estimated to be 122,137,779 euros. The majority of the expenditures (62.47%) were associated with alcohol (mis)use (Table 45).

Table 45: Substance-attributable expenditures (€) for short-term disability

substance	costs	proportion
alcohol	76,302,585	62.47%
tobacco	21,899,373	17.93%
illicit drugs	12,207,304	9.99%
psychoactive medication	11,728,518	9.60%
Total	**122,137,779**	**100.00%**

b) Long-term disability

The total substance-attributable expenditures from long-term disability were estimated to be 273,802,325 euros. Alcohol was found to be the primary cost driver accounting for 61.75% of the total costs, followed by tobacco (18.84%) (Table 46).

Table 46: Substance-attributable expenditures (€) for long-term disability

substance	disability	
	costs	proportion
alcohol	169,066,346	61.75%
tobacco	51,572,566	18.84%
illicit drugs	27,117,170	9.90%
psychoactive medication	26,046,243	9.51%
Total	**273,802,325**	**100.0%**

[120] In 2012, for workers, the first week and for clerks, the first month is not taken into account because this is covered by a 'guaranteed wage'.

[121] This information was derived from the RIZIV/INAMI 2013 annual report on 25/06/2015 http://www.inami.fgov.be/SiteCollectionDocuments/jaarverslag-2013.pdf

[122] This information was obtained in writing from the National Institute of Health and Disability Insurance (RIZIV/INAMI), 'Dienst Uitkeringen'/'Le Service des Indemnités' on 24/06/2015

2.2.2. Productivity losses from premature mortality

The estimation of the substance-attributable expenditures for productivity losses from premature mortality were based on the number of life years lost up to the age of 65 years that could be attributed to substance (mis)use. In Belgium in 2012, the number of life years lost up to the age of 65 years was estimated to be 21,242. The majority of the number of life years lost were associated with premature mortality from tobacco use (60.1%) (Table 47).

Table 47: Substance-attributable years of life lost up to the age of 65 years in Belgium, 2012

substance	years of life lost	
	number	proportion
alcohol	7,672	36.1%
tobacco	12,776	60.1%
illicit drugs	276	1.3%
psychoactive medication	519	2.4%
Total	**21,242**	**100.0%**

Productivity losses due to premature mortality associated with substance (mis)use were estimated to be 1,110,241,464 euros of which 60.6% was due to premature mortality from diseases associated with tobacco use. In contrast, illicit drugs and psychoactive pharmaceuticals were responsible for 1.3% and 2.4% of the total premature mortality substance-attributable costs respectively (Table 48).

Table 48: Substance-attributable costs associated with productivity losses from premature mortality, 2012

Substance	premature mortality	
	costs	proportion
Alcohol	397,156,108	35.8%
Tobacco	672,927,054,	60.6%
illicit drugs	13,936,396	1.3%
psychoactive medication	26,221,906	2.4%
Total	**1,110,241,464**	**100.0%**

In Table 49, the total substance-attributable costs are divided into those that can be assigned to the reference year 2012 and those that arise from productivity losses in future years (up to the age of 65).

Table 49: Substance-attributable costs associated with productivity losses from premature mortality for the reference year 2012 and for future years

substance	premature mortality	
	costs 2012	costs future years
alcohol	20,039,090	377,117,018
tobacco	44,908,330	628,018,724
illicit drugs	386,834	13,549,562
psychoactive medication	714,452	25,507,454
Total	**66,048,706**	**1,044,192,578**

2.3. INTANGIBLE COSTS

The non-financial welfare costs associated with substance (mis)use were estimated using the concept of DALYs. The use of the substances alcohol, tobacco, illicit drugs and psychoactive pharmaceuticals were responsible for an estimated 517,527 DALYs in Belgium in 2012. Tobacco use accounted for the largest share (60.9%), followed by alcohol (32.5%). The number of DALYs for illicit drugs and psychoactive pharmaceuticals was considered as one group because, for the DALYs related with 'drug use disorders' and 'poisonings', it was impossible to make a distinction between illicit drugs and psychoactive pharmaceuticals. Illicit drugs and psychoactive pharmaceuticals accounted for 6.6% of the total number of substance-attributable DALYs (Table 50).

Table 50: Substance-attributable DALYs for Belgium, 2012

substance	number of DALYs	proportion
alcohol	157,500	32.5%
tobacco	295,406	60.9%
illicit drugs psychoactive medication	31,901	6.6%
Total	**484,807**	**100.0%**

Subsequently, an estimation of the substance-attributable expenditures associated with the substance-attributable DALYs had to be made. One DALY was valued with 40,000 euros (Desaigues et al., 2006) resulting in total substance-attributable non-financial welfare costs to the Belgian society of 19,392,266,724 euros (Table 51). Tobacco accounted for about two thirds (60.9%) of the total non-financial welfare costs that could be attributed to substance (mis)use.

Table 51: Substance-attributable non-financial welfare costs in Belgium, 2012

substance	costs	proportion
alcohol	6,300,017,986	32.5%
tobacco	11,816,224,571	60.9%
illicit drugs psychoactive medication	1,276,024,167	6.6%
Total	**19,392,266,724**	**100.0%**

2.4. BENEFICIAL EFFECT OF ALCOHOL

Alcohol may have some preventive health effects for certain diseases, although the literature is not univocal on this (Fillmore et al., 2006; Papadakis et al., 2000). For this reason, we present the possible beneficial effects on the social costs in a separate paragraph and they are not accounted for in the overall cost calculations. Substance-attributable diseases with a potential preventive effect were identified by a SAF with a negative value and included the following diseases: 'ischemic heart disease', 'ischemic stroke', 'hemorrhagic stroke' (only in women), 'cholelithiasis', and 'diabetes mellitus'. The effects on the costs could be estimated for 'hospitalisation in general hospitals', 'lost productivity from premature mortality', and 'non-financial welfare costs'.

The preventive effects of alcohol use amounted to 127,512,037 euros by a reduction in hospital care episodes in general hospitals. For the cost category 'productivity losses from premature mortality, a total of 1,949 avoided YLL were identified resulting in a saving of 100,507,902 euros. Finally, 67,907 DALYs were avoided assuming preventive effects of alcohol consumption representing an estimated saving the non-financial welfare costs of 2,716,264,891 euros.

3. OVERVIEW OF HEALTH COSTS

Table 52: Substance attributable costs of health, 2012

	DIRECT COSTS						
	Illegal drugs	Alcohol	Psychoactive medication	Tobacco	Other (TOB, ID, ALC and PM)	Other (ID, ALC and PM)	Total
Inpatient care							
Hospitalisation							
General hosp.	9,528,880	245,744,850	22,315,378	492,764,937			770,354,045
Psych. Hosp.	74,126,246	498,032,609	58,513,143	7,331,800		58,538,499	696,542,297
Total	83,655,126	743,777,459	80,828,521	500,096,737		58,538,499	1,466,896,342
Sheltered housing and psychiatric nursing homes							
Sheltered Housing	810,259	3,814,635	332,928	32,089	601,677		5,591,589
Psychiatric nursing home	367,308	5,483,377	380,426	131,181	1,167,513		7,529,805
Inpatient rehabilitation							
Crisis intervention centres	8,697,157	501,759	343,798				9,542,713
Therapeutic communities	14,569,277	8,021,672	857,016				23,447,966
De sleutel	396,700						
Projects							
Projects		182,788		220,169		4,641,499	5,044,456
Total inpatient care	108,495,827	761,781,690	82,742,689	500,480,176	1,769,190	63,179,998	1,518,052,871
Outpatient care							
Physician contacts							
GPs	2,048,743	52,428,074	8,826,019	89,158,133			152,460,970
Medical Specialists	1,498,567	38,348,869	6,455,851	65,215,320			111,518,608
Psychiatrists	1,976,068	12,783,113	1,910,405	106,960	1,529,233		18,305,779
General practitioner and certified tobaccologists: tobacco cessation				989,000			989,000
Primary Care Centres					20,416,660		20,416,660
Day centres, medical-social centres and mental health care centres							
Day centres	7,564,208	541,690	119,449				8,225,347

MEDICAL-SOCIAL CARE CENTRES	8,379,206	354,565	213,782			152,950	
MENTAL HEALTH CARE CENTRES	1,801,830	5,176,495	156,681	3,013	1,611,018		**8,749,037**
SPECIALISED ADDICTION TREATMENT CENTRES						5,276,653	**5,276,653**
HOME CARE							
HOME-BASED NURSING CARE	1,164,061	29,788,725	5,014,792	50,658,110			**86,625,687**
PROJECTS							
	1,406,824	315,500	78,475	1,884,615	1,708,168	1,254,756	**6,648,338**
TOTAL OUTPATIENT CARE	**25,839,507**	**139,737,031**	**22,775,454**	**208,015,151**	**25,265,079**	**6,684,359**	**428,316,582**
SOCIAL WORK SERVICES							
GENERAL WELFARE CENTRES							
GENERAL WELFARE CENTRES					3,686,214		**3,686,214**
TELEPHONIC AND ONLINE SUPPORT							
TELEPHONIC AND ONLINE SUPPORT	18,315	60,445	11,588		3,355		**93,703**
PROJECTS							
PROJECTS	308,500				391,767	341,750	**1,042,017**
TOTAL SOCIAL WORK SERVICES	**326,815**	**60,445**	**11,588**		**4,081,336**	**341,750**	**4,821,934**
PHARMACEUTICALS							
PHARMACEUTICALS (PHARMACIES)	4,630,220	2,016,596		4,162,471			10,809,289
TOTAL PHARMACEUTICALS	**4,630,220**	**2,016,596**		**4,162,471**			**10,809,289**
PREVENTION							
INITIATIVES AIMED AT HEALTH PROMOTION							
ASSOCIATION OF GENERAL PRACTITIONERS (DOMUS MEDICA)		11,317		3,000	23,650		**37,967**
PREVENTION WORKERS AT THE MENTAL HEALTH CARE CENTRES (CGG)					1,914,200		**1,491,920**
LOGO					975,415		**975,415**
VIGEZ				238,081			**238,081**
ASSOCIATION FOR ADDICTION PREVENTION AND LIFE SKILL					177,629		**177,629**

IMPROVEMENT							
SUPPORT POINT FOR SCHOOLS IN ADDICTION PREVENTION					219,042		**219,042**
PROJECTS							
PROJECTS	954,478	507,100	227,649	584,168	2,486,983		3,455,810
TOTAL PREVENTION	**954,478**	**529,734**	**227,649**	**1,066,330**	**9,106,855**		**11,885,046**
RESEARCH							
RESEARCH PROJECTS FUNDED BY SPF HEALTH	34,380					20,000	**54,380**
TDI						406,369	**406,369**
FEDERAL RESEARCH PROGRAMME DRUGS (BELSPO)	116,980					297,865	**414,845**
PROGRAMME DRUGS OF THE SCIENTIFIC INSTITUTE OF PUBLIC HEALTH	25,450						**25,450**
ESPAD					27,000		**27,000**
PROJECTS: FEDERAL ADDICTION FUND						46,853	**46,853**
PROJECTS: WALLOON SOCIAL COHESION PLAN					53,423		**53,423**
PROJECTS: COCOF HEALTH INITIATIVES					20,000		**20,000**
PROJECTS: PROVINCIAL INITIATIVES						5,000	**5,000**
TOTAL RESEARCH	**176,810**				**100,423**	**776,087**	**1,053,320**
COORDINATION							
BMCDDA	293,223						**293,223**
ASSOCIATION FOR ALCOHOL AND OTHER DRUG PROBLEMS						2,278,729	**2,278,729**
NETWORKS (COCOF)	48,298					55,800	**104,098**
PILOT PROJECT FPS HEALTH: MENTAL HEALTH CARE						374,177	**374,177**

COORDINATOR							
PROJECTS: FEDERAL ADDICTION FUND	43,300					216,590	**259,890**
PROJECTS: WALLOON SOCIAL COHESION PLAN					284,922		**284,922**
PROVINCIAL DRUG COORDINATION						373,034	**373,034**
TOTAL COORDINATION	**384,821**				**284,922**	**3,298,330**	**3,968,073**
TOTAL DIRECT COSTS	**136,178,258**	**902,108,900**	**105,757,380**	**709,561,657**	**40,607,805**	**74,280,524**	**1,968,097,826**
PROPORTION	**6.92%**	**45.84%**	**5.37%**	**36.05%**	**2.06%**	**3.77%**	**100%**

INDIRECT COSTS							
	ILLEGAL DRUGS	ALCOHOL	PSYCHOACTIVE MEDICATION	TOBACCO	OTHER (TOB, ID, ALC AND PM)	OTHER (ID, ALC AND PM)	TOTAL
PRODUCTIVITY LOSSES FROM DISABILITY							
SHORT-TERM (≤365 DAYS)	12,207,304	76,302,585	11,728,518	21,899,373			**122,137,779**
LONG-TERM (>365 DAYS)	27,117,170	169,066,346	26,046,243	51,572,566			**273,802,325**
TOTAL DISABILITY	**39,324,474**	**245,368,931**	**37,774,761**	**73,471,939**			**395,940,104**
PRODUCTIVITY LOSSES FROM PREMATURE MORTALITY							
PRODUCTIVITY LOSSES FROM PREMATURE MORTALITY							
YEAR 2012	386,834	20,039,090	714,452	44,908,330			**66,048,706**
FUTURE YEARS	13,549,562	377,117,018	25,507,454	628,018,724			**1,044,192,578**
TOTAL PREMATURE MORTALITY	13,936,396	397,156,108	26,221,906	672,927,054			**1,110,241,464**
TOTAL INDIRECT COSTS	53,260,870	642,525,039	63,996,667	746,398,993			**1,506,181,569**
PROPORTION	**3.54%**	**42.66%**	**4.25%**	**49.56%**			**100%**

	INTANGIBLES						
	ILLEGAL DRUGS	ALCOHOL	PSYCHOACTIVE MEDICATION	TOBACCO	OTHER (TOB, ID, ALC AND PM)	OTHER (ID, ALC AND PM)	TOTAL
NON-FINANCIAL WELFARE COSTS	1,276,024,167*	6,300,017,986		11,816,224,571			**19,392,266,724**
PROPORTION	**6.58%**	**32.49%**		**60.93%**			**100%**

*intangible costs: illicit drugs + psychoactive pharmaceuticals

CRIME

1. METHODS

1.1. Introduction

Below, an overview is provided on the methods used to estimate the substance-attributable direct, indirect and intangible costs related to 'crime'. In Table 53, an overview is provided of the different cost components pertaining to the three major cost categories 'direct costs', 'indirect costs', and 'intangible costs' that were included in the SOCOST research project.

Table 53: Cost categories related to 'Crime' included in the SOCOST research project

Main cost category	cost items
DIRECT COSTS	
Investigation	Federal Police
	Local Police
	Customs
	FAMHP
	Inspection Tobacco/alcohol
	CTIF-CFI
	Interpol
	Europol
	FASFC
	JEP
Prosecution	Public Prosecutor's Office
	Proefzorg
Sentencing	General Courts
	Legal Aid
	Legal Expenses
	Drug Treatment Court
Sentence Execution	Correctional Facilities
	Federal Youth Institutions
	Community Youth Institutions
	Houses of Justice
	Electronic Surveillance
	Sentencing Court
	Illicit drugs aimed projects
	ASM
Coordination	Criminal Policy
	UNODC
Civil Service & Fire Department	
Research	NICC
	Federal Research
Property Loss	

Prevention	SVPP
INDIRECT COSTS	
Productivity loss	As a consequence of premature mortality
	As a consequence of incarceration
Anticipation to theft	
INTANGIBLE COSTS	
Disability-adjusted life years (DALYs)	Interpersonal violence

1.2. Input nomenclature

The Socost study includes costs associated with both non-consensual crimes that can be linked to substance misuse and substance law violations (Stevens, 2007; De Ruyver et al., 2013).[123] Concerning the non-consensual crimes, three categories are under study: property crimes, violent crimes and sexual crimes (Jarl et al., 2008; Miller et al.,2001; Bouchery et al., 2011; Fernandez et al., 2012).

Calculations are, if possible, based on data collected by the different institutions under research. On each level of the justice system[124], each new case is registered under a specific code, defining its content. The whole of these codes form the input nomenclature.[125] This list is determined by each level of the justice system and forms the base of their registration system. In order to obtain the right data, we use these input nomenclatures to select the cases relevant for the current study.

Unfortunately it is not possible to use the statistics of the integrated police, public prosecutor's office, general courts and correctional facilities parallel to each other (see also Van Dael & De Bruycker, 2014).[126] There are some essential differences regarding methodological possibilities and content. So far, there is no vertical integration concerning registration methods and categories between the different levels of the justice system.[127] Each input nomenclature is based on the administrative organization and the needs of the institution in question.

For example, the police crime statistics record violations of the criminal law and structure them according to legal qualifications in the criminal law. The statistics of the public prosecutor's office on the other hand are based on the actual organization and important themes of the public prosecutor's office. This means it is possible an input code is created to describe charges that are not as such described in the criminal law, for example car-jacking.

The offences registered under a certain category (e.g. violent crimes) at one level of the justice system are not necessarily the same offences registered under that category on another level of the justice level. In

[123] Crimes are defined as violations of laws. Hence the expenditures associated with deviant behaviour that violates prevailing norms, but no laws, like nuisance, are excluded in the present study.
[124] Investigation, prosecution, sentencing and sentence execution.
[125] Often, new categories are formed based on this input nomenclature in order to communicate information on certain crime trends or specific forms of crime. These new categories form the output nomenclature.
[126] http://www.om-mp.be/stat/corr/start/n/nomenclatuur.html
[127] However, the problem is known and solutions are being discussed and slowly developed (e.g. Van Dael & De Bruycker, 2014).

order to ensure the same offences are included in the calculations on the different levels of the justice system the input nomenclature of the integrated police is used as a starting point. The categorization of specific offences as violent crimes, property crimes and sexual crimes according to this nomenclature was used to align offences registered on other levels of the justice system to these categories. The input nomenclature of the integrated police was chosen as a reference point for two reasons. First, it is the first level of the justice system, registering all recorded offences according to definitions in the criminal law. Second, the calculation of the substance attributable fractions for each level of the justice system (see further) starts from the substance attributable fractions based on integrated police data. These fractions are calculated by de Ruyver et al. (2008) who also base their calculations on the input nomenclature of the integrated police.

1.3. Substance attributable fractions (SAF)

We make a distinction between substance law violations that are inherently related to addictive substance misuse and non-consensual crimes that are indirectly related to addictive substance misuse. For substance law violations, such as trafficking and dealing, it holds that, in the hypothetical situation that addictive substances do not exist, these crimes could not exist as well. Hence the calculation of the costs of substance law violations linked to the addictive substances is straightforward, as the total number of these crimes can be attributed to substance abuse.

However, in order to calculate the cost of non-consensual crimes attributable to substance misuse, it is necessary to know what proportion of crime is actually attributable to that substance misuse. To obtain more reliable estimates, specific attributable fractions can be used for every substance and for every level of the criminal justice system separately.[128] To calculate these fractions Belgian data are used whenever possible and only when necessary they are substituted with international data. This will be clearly indicated.

Ideally, attributable fractions are based on data on the proportion of registered cases which are linked to substance misuse, provided by the different institutions themselves. Unfortunately this is not registered by Belgian legal institutions. Only the integrated police provides the possibility to register substance misuse when reporting on other crimes (e.g. suspect under influence at the time of crime). However, this registration is not mandatory, resulting in considerable underreporting.[129] Hence these data will not be used in this study. Because of these data limitations and since conducting separate research in order to determine the attributable fractions for each illicit substance and criminal justice system level would necessitate a separate study, we are limited to existing research and other European data to estimate these substance attributable fractions.

[128] An increase or decrease in these fractions, does not represent an increase or decrease in the risk of a certain case 'making it' to a certain level of the justice system. Rather, these fractions should be seen as the proportion of the total cases in a certain category of crime that can be attributed to substance misuse at each level of the justice system separately. These fractions are calculated independent of each other, meaning the sum of these fractions does not equal 100%.
[129] This information was provided in writing by the FEDERAL POLICE, 27/01/2015.

De Ruyver et al. (2008) calculated the **illicit drug attributable fractions** for crimes registered by the Belgian integrated police.[130] According to them, 7,3% of all property crimes, 14,4% of all violent crimes and 19,9% of all sexual crimes can be attributed to illicit drugs use. Because these numbers are police-level specific, they have to be adjusted in order to use them for other levels of the criminal justice system. In order to do so we make the assumption that a rise in the number of substance law violations also implies a rise in the number of non-consensual crimes attributable to substance misuse. This allows to adjust the given attributable fractions for the ratio between the number of registered drug law violations and the total of all relevant registered crimes[131], compared for the integrated police and the other levels of the criminal justice system. In line with the scope of this research the total number of relevant crimes is limited to the sum of *property crimes, violent crimes, sexual crimes, illicit drug law violations for the calculation of the illicit drug attributable fractions and property crimes, violent crimes, sexual crimes and alcohol law violations for the calculation of the alcohol law violations.*The following formula is used:

$$\text{Crime specific attributable fraction}_{\text{Level integrated police}} * \frac{\text{Ratio illegal drug law violations/total relevant cases}_{\text{Other levels justice system}}}{\text{Ratio illegal drug law violations/total relevant cases}_{\text{Level integrated police}}}$$

For example, when calculating the illicit drug attributable fraction for violent crimes on the prosecution level (public prosecutor's office) the reasoning would be as follows. We hereby assume that the illicit drug attributable fraction is congruent with the ratio drug law violations/total relevant crimes:

Integrated police known	Illicit drug attributable fraction Violent crime 7.3%	Ratio drug law violations/total relevant crimes (44,090/640,043) 0.0689 (A)
Public prosecutor known	Illicit drug attributable fraction Violent crime X	Ratio drug law violations/total relevant crimes (37,250/440,815) 0.0845 (B)

[130] For this study De Ruyver et al. (2008) base their calculations on Belgian police data from 2004-2005. Given the extent of the study is was not possible to redo these calculations for the year 2012 within the scope of the current research. It was also not possible to use German fractions as we did for the calculations of the alcohol attributable fractions, since the German data provide no information on the proportion of suspects under the influence of illicit drugs at the time of the offence for violent and sexual crimes. However, the use of these 2004-2005 estimates is still reasonably valid today since no major policy changes have been made concerning illicit drugs, regarding the integrated police, between 2005 and 2012. Illicit drugs, and more specifically the production of synthetic drugs and cannabis, the import and export of cocaine and illicit drugs dealing, are a priority crime phenomenon throughout the national security plans of 2004-2007; 2008-2011 and 2012-2015. The power lines in the national security plan are reflected in the zonal security plans of the local police. See also http://www.polfed-fedpol.be/org/org_pns_nl.php. For more information on the Belgian Drug Policy see http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=64&Itemid=74&lang=dutch.

[131] Registered crimes, does in fact refer to registered criminal cases.

Calculation Adjustment factor	⇨	(0.0845/0.0689) 1.2267 (B/A)
Calculation X	7.3% * 1.2267	9,0%

Table 54 gives an overview of these calculations for all levels of the criminal justice system.

Table 54: Calculation of illicit drugs attributable fractions, 2012*

	INVESTIGATION	PROSECUTION	SENTENCING**	SENTENCE EXECUTION***
Illicit Drug law violations/ Total cases	(44,090/640,043) 0.0689	(37,250/440,815) 0.0845	(6648/53,512) 0.1242	(4673/37,771) 0.1237
Adjustment factor	/	(0.0845/0.0689) 1.2267	(0.1242/0.0689) 1.8033	(0.1237/0.0689) 1.7960
Attributable fraction property crimes	19.9%	24.4%	35.9%	35.7%
Attributable fraction violent crimes	7.3%	9.0%	13.2%	13.1%
Attributable fraction Sexual crimes	14.4%	17.7%	26.0%	25.9%

* The numbers displayed in the table are rounded up for clarity. This means intermediate solutions calculated using these numbers might vary compared to the ones displayed here.

** Data limitations on this level force us to use the total number of closed (criminal) cases (360,599) and determine the number of drug law violations based on the number of convictions in 2012. First we determine the share of relevant closed cases. In 2012 14.84% of all convictions were for the crimes under consideration (property crimes, violent crimes, sexual crimes and illicit drug law violations). This means 53,512 closed cases. Of those closed case we next determine the number of illicit drug law violations again based on the number of convictions. In 2012 12.42% of all convictions for the crimes under consideration were for illicit drugs law violations. If we apply this number to the number of relevant closed cases, this gives us 6648 closed cases for illicit drug law violations.

***For these calculations we used the number of effective convictions (court rulings resulting in punishing measures), leaving out suspensions and internments. We hereby make the assumption that every sentence is executed. In reality this isn't always the case. This could mean the substance attributable fractions for the level of sentence execution are an overestimation.

For the **alcohol attributable fractions** no reliable Belgian study estimating these fractions could be found. Further, intoxication at the time of crime/arrest is not mandatory registered by the integrated police. As mentioned, some data are registered by the integrated police, but they represent a serious underestimation and are preferably not used for cost calculations. Therefore we resorted to other European police data. More specifically we looked at data provided by the German central police agency or Bundeskriminalamt[132] because 1) the prevalence of alcohol dependency is similar in Germany and

[132] The German Bundeskriminalamt is the central police agency at federal level and responsible for coordination, information and communication between the 16 different state police forces of Germany (and the federal police or Bundespolizei). They are also responsible for the investigation of international organized crime, terrorism and other cases of national security. Every year the Bundeskriminalamt publishes an overview of federal crime statistics for that given year. These statistics provide information on crimes, attempts to crime and identified suspects registered by the polices and other information on cases, victims and suspects. Not included in these data are crimes against state security, road traffic offences, crimes not within police competence (such as financial and fiscal crimes) and offences that are immediately brought before the public prosecutor's office. The published federal statistics are based upon data being supplied by the individual states as individual delivered data sets. The Bundeskriminalamt

Belgium (Rehm, Shield, Rehm, Gmel, & Frick, 2012) and 2) the German police system show some parallels with the Belgian system, (although important differences can also be noted).[133]

The Bundeskriminalamt reports a total of 13.4% (280,351) of all suspects that were under the influence of alcohol at the time of offence in 2012.[134] More specifically they report the following crime specific numbers[135]:

Table 55: Suspects under influence of alcohol at the time of offence - German Police Data, 2012

	Offence	%	Total	Alcohol
violent crimes	Murder (*Mord)*	19.7%	731	144
	Manslaughter *(Totschlag und Tötung auf Verlangen*)	37.5%	1844	692
	Assault resulting in death *(Körperverletzung mit Todesfolge)*	30.4%	79	24
	Assault *(Gefährliche und schwere Körperverletzung)*	34.6%	147,184	50,933
	Use of violence *(Gewaltkriminalität)*	32.2%	182,013	58,448
	Total	**33.2%**	**331,851**	**110,241**
property crimes	Robbery *(Raubdelikte)*	18.4%	31,674	5823
	Total	**18.4%**	**31,674**	**5823**
sexual crimes	Rape and sexual assault *(Vergewaltigung und sexuelle Nötigung)*	28.9%	6776	1957
	Other sexual assault *(sonstige sexuelle Nötigung)*	21.7%	4067	884
	Total	**26.2%**	**10,843**	**2841**

uses these data to compile statistics and tables on the federal level. See also BUNDESKRIMINALAMT, www.bka.de and Police Crime Statistics, 2012, http://www.bka.de/nn_193232/DE/Publikationen/PolizeilicheKriminalstatistik/2012/pks2012__node.html?__nnn=true.

[133] On a local level the German police system is organized around the individual police forces of the German states or Landespolizei. On the federal level we can find on the one hand the federal police or Bundespolizei which is mainly responsible for national and international operational tasks. The Bundeskriminalamt, or federal investigation, on the other hand is responsible for (inter)national criminal investigation and the coordination of the local and the federal police. The Bundeskriminalamt is also responsible for communication and information. An important difference with the Belgian system is that the Landespolizei can autonomously determine their policy and is not dependent on the federal government as is the case in Belgium. Furthermore, the local and federal police forces are not integrated but operate next to each other. Their cooperation is voluntary and not legally determined as is the case in Belgium.

[134] These numbers are limited to the number of suspects under influence at the time of the offence as recorded by the German police in Germany 2012. The illicit drug attributable fractions are based on a more elaborate definition and include data on suspects under influence at the time of offence, victims under influence at the time of offence, crimes committed to buy illicit drugs, possession of illicit drugs at the time of offence, the use of illicit drugs and systemic crimes (De Ruyver et al., 2008). This can imply the alcohol attributable fractions to both be underestimated (not every alcohol attributable case is reported/registered) and/or overestimated (being under influence at the time of offence does not automatically mean that the offence is alcohol attributable or would not have taken place in the absence of alcohol).

[135] BUNDESKRIMINALAMT, Polizeiliche Kriminalstatistik 2012, Bundesrepublik Deutschland: http://www.bka.de/DE/Publikationen/PolizeilicheKriminalstatistik/pks__node.html?__nnn=true

These estimates will be used for the purpose of our study. They will be adapted to all levels of the justice system using the same formula which was used to calculate the illicit drug attributable fractions. These calculations can be found in Table 56:

Table 56: Calculation of alcohol attributable fractions , 2012*

	INVESTIGATION	PROSECUTION****	SENTENCING**	INCARCERATION***
Alcohol law violations/Total cases	(20,065/616,081) 0.0326	/	(1060/47,924) 0.0221	(812/33,910) 0.0239
Adjustment factor	/	/	(0.0221/0.0326) 0.6790	(0.0239/0.0221) 0.7352
Attributable fraction property crimes	18.4%	18.4%	12.5%	13.5%
Attributable fraction violent crimes	33.2%	33.2%	22.5%	24.4%
Attributable fraction Sexual crimes	26.2%	26.2%	17.8%	19.3%

*The numbers displayed in the table are rounded up for clarity. This means intermediate solutions calculated using these numbers might vary compared to the ones displayed here.

** Data limitations on this level force us to use the total number of closed (criminal) cases and determine the number of drug law violations based on the number of convictions in 2012. First we determine the share of relevant closed cases. In 2012 13.29% of all convictions were for the crimes under consideration (violent crimes, property crimes, sexual crimes and alcohol law violations). This means 47,924 closed cases. Of those closed case we next determine the number of alcohol law violations, again based on the number of convictions. In 2012 2.21% of all convictions for crimes under consideration were for alcohol law violations. If we apply this number to the number of relevant closed cases, this gives us 1060 closed cases for alcohol law violations.

***For these calculations we used the number of effective convictions (court rulings resulting in punishing measures), leaving out suspensions and internments. We hereby make the assumption that every sentence is executed. (In reality this isn't always the case.)

**** Cases of public intoxication are addressed by the police prosecutor's office. For this office there are no data available by type of offence. This means a serious underestimation of the number of alcohol law violations (100), since cases of public intoxication can expected to from the majority of alcohol law violations, when comparing public intoxication numbers on other levels of the justice system. Using these numbers results in seriously underestimated alcohol attributable fractions on the prosecution level. Therefore, by exception, we extend the alcohol attributable fractions on the investigation level to the prosecution level. This is possible because we use data on the number of new cases, (meaning the number of cases before dismissal), and in theory every case should flow from the investigation level to the prosecution level.

Studies calculating the tobacco and psychoactive medication attributable fractions could not be found. Although the literature does discuss a possible connection between psychoactive medication misuse and some forms of crime, such as violent crimes (Tiihonen et al., 2015), this effect could be expected to be very small (T. J. Moore, Glenmullen, & Furberg, 2010). Not including the costs of psycho-active medication attributable property, violent and sexual crimes will thus only imply a minor underestimation of the social costs of substance abuse in Belgium. Further, we assume that tobacco does not lead to property, violent or sexual crime (Caulkins & Kleiman, 2011). Of course, tobacco law violations and psychoactive medication law violations, such as smuggle, forgery, illicit usage etc. are included in our estimations if data are available.

1.4. Calculation methods used

In order to be able to calculate the costs of crime, we first need to determine the number of relevant cases in the period under study. When available, costs are calculated based on the (substance related) expenses recorded for the year 2012 for each institution. For this purpose data concerning the realized budget for 2012 as reported in the federal budget are preferably used, or, when unavailable, concerning the total expenses for 2012 as reported by the services and institutions in question. If both of these options are unavailable, the total budget available for 2012 as reported by the concerned institutions or services is used. Only for the costs related to correctional facilities, unit costs will be used as recommended by Vander Laenen, De Ruyver, Christiaens and Lievens (2011).

Cost calculations are based on the number of new cases recorded. Long term cases (covering more than 1 year) are not included under the assumption that by including new cases, future long term cases are also included. The costs for long term cases in 2012 are thus calculated as new cases in previous years. Only regarding the general courts data on the number of closed cases are used, since the available data on new cases are limited and would lead to the exclusion of several courts.

1.4.1. Direct costs

To estimate the direct costs associated with substance attributable crimes, two methods are used, depending on data availability. The first method starts from a total budget and is used for those costs for which there is information available on the total expenses in 2012. The second method starts from a unit costs and is used for those costs for which an average cost in known (or can be estimated). These costs are calculated for each type of crime and each type of substance separately

1. *Method 1: Total budget * relevant proportion*

For those studies were there is information available on the total expenses or the total budget in 2012, the estimation of these costs will be based on the following formula (Fernández, 2012). These costs will be calculated for each type of crime and for every substance separately.[136]

*Total budget * fraction of activities linked to relevant crimes * SAF*

2. *Method 2: Unit cost * number of cases*

For those costs associated with crimes attributable to substance uses for which an average cost is known or can be estimated, the estimation of the total of these costs will be based on the following formula (Miller, Levy, Cohen, & Cox, 2006).

*Unit cost * number of offences * SAF*

[136] Some researchers also adjust this estimation for varying workloads, for example by type of crime (Fernández, 2012) or difficulty of activity (Moolenaar, 2009). However, data limitations seriously limit the possibility of this study to do so, with some exceptions. An example of such a calculation can be found in the SWOT-analysis.

1.4.2. Indirect costs

Substance misuse can reduce economic output and production due to lower productivity, absence from the workplace or workers dying prematurely. According to Cohen (2005) three categories can be identified in relation to crime: 1) lost workdays resulting in lost wages and lost productivity as a cost for society; 2) lost housework and 3) lost school days. These economic losses can be short term (medical consequence of crime or dealing with the justice system including incarceration), or long term (premature mortality or reduced lifetime earnings). This study is limited to the calculation of productivity losses due to lost workdays because of crime for both the offender (incarceration) and the victim (premature mortality and injury).

In calculating productivity losses due to incarceration most studies rely on average annual wage rates in the population (before taxes) and the number of prisoners in a given year and use this as a proxy for the lost productivity of an inmate not able to work (Fernández, 2012; Jarl et al., 2008; Mark, Woody, Juday, & Kleber, 2001). Tailoring this formula to our research, we will use the following formula:

*# incarcerations in 2012 * average duration of detention* % economical active inmates prior to detention * daily labour costs * SAF*

This formula is based on the average duration of detention, rather than the number of detainees in a given year, which allows for a more accurate estimation of the actual days of lost productivity. Further, we only take the proportion of detainees that were actually economically productive prior to detention into account. Detainees without a legal job prior to detention would not be economically productive before detention and thus their incarceration does not imply productivity loss, only lost wages (transfer cost).[137] Part of this group would have a legal income based on social welfare payments or unemployment benefits, but since these can be seen as transfer costs that are not linked to additional productivity, the loss of these payments cannot be seen as productivity loss. Further, the mean (daily) labour costs is used instead of the average wage, because this gives a more correct estimate of the productivity value for society.

In addition productivity losses for lost days of work by victims of crime will also be included. Lost work days by the victim can also be caused by premature death due to crime. In that case the number of lost work days can best be estimated by the number of productive life years lost due to crime, until the age of 65 (YLL_{crime})[138]. The annual mean labour cost for the reference year 2012 was halved assuming that some premature mortality cases occurred at the beginning of the year and others at the end. [139] Based on Konnopka & König (2009), we use the following formula.

*SAF *YLL_{crime} * annual labour costs * mean employment rate*

[137] Following Cohen (2005) we make a distinction between 'productivity loss' which is a loss to society and lost wages, which is a transfer costs and only a loss to the individual in question. Therefore we only take 'productivity losses' into account. This means only that part of detainees that actually was productive before incarceration is taken into account.

[138] See the section on Health for the exact calculation of the years of life lost due to premature death.

[139] *- [1/2 average annual labour cost * mean employment rate *# cases 2012 * SAF]*

1.4.3. Intangibles

Crime in general can have several non-economic consequences, such as pain, suffering and loss of life (M. T. J. Moore & Caulkins, 2006; Single, 2003). Although society and individuals are willing to pay to avoid such losses, it is difficult to estimate their monetary value since they have no market-price. In this study we will use the 'Disability-Adjusted Life Years-approach or DALY-approach.[140] Similar to health, DALYs can be used for calculating intangible costs caused by crime by taking the number of healthy life years lost due to injury, disability or dead caused by crime into account. They do so by incorporating non-fatal and fatal health outcomes, calculated as the years of life lived with disability (YLD) and the years of life lost due to premature death (YLL). Data on DALYs for Belgium can be found on the World Health Organization (WHO) global burden of disease DALY estimates for the year 2012.[141] The following formula is used:

$$SAF * DALY_{crime} * unit\ cost$$

The value of 1 DALY is estimated at 40,000 euros in line with European Commission which estimated the value of a healthy life year in the EU at 40,000 euros (Desaigues et al., 2007). In our view, this is a conservative estimate for Belgium since the life-standard in Belgium (measured in GDP and AIC) is above the EU28-average.[142]

1.4.4 Remarks

Throughout the document, the performed calculations are outlined in tables. It should be kept in mind that these use rounded up figures. This means calculations using these numbers might slightly differ from the displayed totals. Further when interpreting the reported costs and especially when comparing costs linked to different substances, it should be kept in mind what costs are included for each substance. For example, there are no attributable fractions calculated for tobacco use and psycho-active pharmaceuticals. This means that costs related to these substance related non-consensual crimes could not be calculated, resulting in an underestimation of the costs linked to these substances.

[140] Next to DALY's the literature also mentions other methods to estimate intangible costs. More specifically the following methods are used in other studies: stated preference methods (e.g. willingness to pay, jury awards); revealed preference methods (e.g. hedonic pricing) and the use of monetary values for health and safety in other sectors (Czabanski, 2008) . Because each of these methods implies considerable methodological issues and no data are available for Belgium, this study will use the DALY approach. However, some remarks also have to be made regarding this approach: 1) The calculation of lost DALY's is based on the number of life years lost because of typical physical consequence of crime, such as e.g. a broken arm in case of assault. This implies uncertainties and making several assumption e.g. the number of victims, the chance a victim will catch a certain negative consequence, estimation of the duration of the negative consequences etc.; 2) fear and stress are not measured; 3) the experience of being a victim, next to the costs of negative mental and physical consequences is not measured.

[141] This information was derived from the World Health Organization website on 14/03/2015 http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html

[142] See Eurostat.eu.

2. RESULTS

2.1. DIRECT COSTS

A. Direct costs as a response to crime

2.1.1. Investigation

Federal police *(Federale politie/Police fédérale)*

The integrated police is, according to the law of December 7th 1998, structured on two levels: the federal and the local police. Both levels complement each other and work in close cooperation.[143] The federal police is responsible for specialized judicial and administrative assignments and performs operational, administrative and logistic support missions.[144] In order to carry out these task, she is active in specific criminal domains and deals with all crime phenomena beyond the local level. The federal police also provides support to the local level. Finally, the federal police represents all Belgian police services within the framework of international police cooperation.

This means that the federal police forms an important actor on the investigation level. The national security plan 2012-2015 of the federal police puts illicit drug law violations, among others, on the foreground as one of the priority crime phenomena. The focus lies on the import and export of cocaine, the production and smuggle of synthetic drugs and cannabis[145] and dealing. Also in terms of road safety, driving under the influence of alcohol and/or illicit drugs is one of the priorities.

The total expenses of the federal police in 2012 on personnel and operating costs were 1,091,276,122 euros.[146] [147] A total of 5,739,740 offences were recorded by the integrated police, of which 1,035,567 were criminal offences, 52,988 were violations of police regulations[148] and 4,651,261 were traffic incidents.[149] Of those cases, 504,726 were property crimes (8.79%), 7953 were sexual crimes (0.14%) and 83,274 were violent crimes (1.45%). Further, 44,090 drug law violations[150] (0.77%) were recorded, 20,065 alcohol law violations (0.35%), 732 tobacco law violations (0.01%) and 68 psychoactive medication law violations (0.001%). Table 57 gives an overview of the costs associated which each of these offenses, by

[143] For more information, see the website of the federal police: http://www.polfed-fedpol.be/org/org_polint_en.php.
[144] See also http://www.polfed-fedpol.be/org/org_polint_en.php.
[145] In Belgium, possession of cannabis is also punishable by law. However in case of adult offenders, punishment for possession for personal use (max. 3 grams of 1 plant) is given the lowest penal priority in 2012 (since 2003). Only in case of minor offenders, a police report is always transferred to the juvenile prosecutor.
[146] FEDERAL POLICE, Annual Rapport 2013, Brussels, 2013.
http://www.polfed-fedpol.be/pub/jaarverslag/pub_jaarverslag_nl.php. Contributions to the local police and expenditures for detached personnel are excluded.
[147] In this case we didn't look at the financial equalization, although available in the federal Budget, since we needed to extract the federal contribution to the local police.
[148] FEDERAL POLICE, Criminal statistics 2000-2012.
http://www.polfed-fedpol.be/crim/crim_statistieken/stat_2013_trim4_nl.php
[149] This information was provided in writing by the FEDERAL POLICE, department of Police Information and ICT, 27/01/2015 and 11/02/2015.
[150] Of the 44,090 registered illicit drug law violations 30,053 were for possession, 1,367 were for fabrication, 1,278 were for (facilitating) usage, 6,407 were for trade, 3,499 were for import and export and 148,6 were for other offences. This information was provided in writing by the FEDERAL POLICE, department of Police Information and ICT, 27/01/2015 and 11/02/2015.

applying the substance attributable fractions for the investigation level. Together these costs form a total expenditure of **56,109,708 euros** for the federal police related to substance misuse.

Table 57: Overview calculation expenditures federal police, 2012

Expenditure category	Total budget (euros)	Fraction specific offence	Substance Attributable fraction	Cost (euros)	Proportion
Illicit drug law violations	1,091,276,122	0.77%	100%	8,402,826	14.98%
Alcohol law violations	1,091,276,122	0.35%	100%	3,819,466	6.81%
Tobacco law violations	1,091,276,122	0.01%	100%	109,128	0.19%
Psych. medication law violations	1,091,276,122	0.001%	100%	10,913	0.02%
Property crime ID	1,091,276,122	8.79%	19.90%	19,088,711	34.02%
Violent crime ID	1,091,276,122	1.45%	7.30%	1,155,116	2.06%
Sexual crime ID	1,091,276,122	0.14%	14.40%	220,001	0.39%
Property crime A	1,091,276,122	8.79%	18.4%	17,649,863	31.46%
Violent crime A	1,091,276,122	1.45%	33.2%	5,253,403	9.36%
Sexual crime A	1,091,276,122	0.14%	26.2%	400,280	0.71%
			TOTAL	56,109,708	100.00%

ID: Illicit Drugs, A: Alcohol

Local police *(Lokale politie/Police local)*

The local police carries out basic judicial and administrative tasks within a specific police zone. More specifically, she is responsible for seven basic police tasks: community policing, assistance, local intervention, assistance to victims, local investigations, maintenance of law and order and road traffic. The focus points in the national security plan are reflected in the zonal security plans of the local police, including the focus on illicit drug law violations. As such she forms an important actor in terms of primary policing. In 2012 the Belgian territory was divided into 195 local police zones.

The local police is financed through different funding channels: In 2012 0.8% of the total budget are revenues from services, 37.9% comes from federal dotation, 60.9% comes from community dotation and the remaining 0.4% is dept collection.[151] In total the local police spend 2,720,752,000 euro in 2012 of which 2,589,752,000 euro were used for personnel and operational costs[152] (see Table 58) and 131,000,000 euros were investment costs.[153]

[151] BELFIUS, Direction Research, Finances of the local police zones 2012, Brussels 2012: https://www.belfius.be/publicsocial/NL/Expertise/Studies/LokaleFinancien/OCMWPolitiezones/Archief/index.aspx

[152] BELFIUS, Direction Research, Finances of the local police zones 2012, Brussels 2012: https://www.belfius.be/publicsocial/NL/Expertise/Studies/LokaleFinancien/OCMWPolitiezones/Archief/index.aspx

[153] BELFIUS, Direction Research, The financial situation of the local police zones 2014, Brussels 2014: https://www.belfius.be/publicsocial/NL/Expertise/Studies/LokaleFinancien/OCMWPolitiezones/index.aspx

Table 58: Expenses of the local police, 2012[154]

	In euros ('000)	In euros/inhabitant	In % of the total expenses	Evolution 2011-2012 in %
Staff	2 208 915	200	85.3%	4.8%
Operational	291 233	26	11.2%	5.1%
Transfer	24 449	2	0.9%	-3.2%
Debt	65 155	6	2.5%	2.3%
TOTAL	**2 589 752**	**235**	**100.0%**	**4.7%**

The share of registered substance law violations and substance attributable non-consensual crimes are measured in the same way as those of the federal police. Because the data for the federal and local police are registered in one integrated data-base, the same numbers are used for the calculation of the local police expenditures as for the federal police expenditures. This necessarily assumes that both levels of the integrated police make the same kind of resource and time investments in substance attributable crime. Finally we apply the substance attributable fractions on the investigation level. This gives us a total expenditure of **139,891,817 euros**. Table 59 gives an overview of these calculations by type of crime: substance law violations and property/violent crimes related to alcohol and illicit drugs.

Table 59: Overview calculation expenditures local police, 2012

Expenditure category	Total budget (euros)	Fraction specific offence	Substance Attributable fraction	Cost (euros)	Proportion
Illicit drug law violations	2,720,752,000	0.77%	100%	20,949,790	14.98%
Alcohol law violations	2,720,752,000	0.35%	100%	9,522,632	6.81%
Tobacco law violations	2,720,752,000	0.01%	100%	272,075	0.19%
Psych. medication law violations	2,720,752,000	0.001%	100%	27,208	0.02%
Property crime ID	2,720,752,000	8.79%	7.3%	47,591,666	34.02%
Violent crime ID	2,720,752,000	1.45%	14.4%	2,879,916	2.06%
Sexual crime ID	2,720,752,000	0.14%	19.9%	548,504	0.39%
Property crime A	2,720,752,000	8.79%	18.4%	44,004,355	31.46%
Violent crime A	2,720,752,000	1.45%	33.2%	13,097,700	9.36%
Sexual crime A	2,720,752,000	0.14%	26.2%	997,972	0.71%
			TOTAL	**139,891,817**	**100.00%**

ID: illicit drugs; A: alcohol

[154] BELFIUS, Direction research, Finances of the local police zones 2012, Brussels 2012: https://www.belfius.be/publicsocial/NL/Expertise/Studies/LokaleFinancien/OCMWPolitiezones/Archief/index.aspx

Customs (Douane)

The customs and excise authorities are responsible for, among others, 'protecting the European Community against the unfair and illicit trade and promoting the lawful economic activity'. Of course, this implies that they are also responsible for the tracing of (illicit) import and export of illicit drugs, alcohol, tobacco and psychoactive medication.

In 2012 a total of 35,395 violations were recorded by custom services: 7654 by primary services, 446 by investigation services and 27,295 by motorized brigades[155]. Of those offences, 660 (1.86%) were related to illicit drug law violations, 85 (0.24%) to alcohol law violations and 65 (0.18%) to tobacco law violations. In 2012 a total budget of 208,414,000[156] euros was realized by the Department of Customs and Excise. Applying the substance attributable fractions on the investigation level, this means a total expenditure of **4,751,839 euros** of which 3,876,500 euros are illicit drug attributable, 500,194 euros are alcohol attributable and 375,145 euros are tobacco attributable:

Table 60: Overview calculation expenditures customs, 2012

Expenditure category	Total budget (euros)	Fraction specific offence	Substance Attributable fraction	Cost (euros)	Proportion
Illicit drug law violations	208,414,000	1.86%	100%	3,876,500	81.58%
Alcohol law violations	208,414,000	0.24%	100%	500,194	10.53%
Tobacco law violations	208,414,000	0.18%	100%	375,145	7.89%
			TOTAL	**4,751,839**	**100.00%**

Federal agency for medicines and health products (FAMHP)

(Federaal agentschap voor geneesmiddelen en gezondheidsproducten/Agence fédérale des médicaments et des produits de santé)

The FAMHP is the competent authority for medicines and health products in Belgium and watches over the quality, safety and efficacy of medicines and health products.[157] Following the 2008-2012 business plan, one important task of the FAMHP in 2012 was the battle against forged (counterfeit) and other illicit medicines, as well as activities regarding the traceability and control of medical devices.

The FAMHP is structured around three main departments: the DG Pre-authorization, the DG Post-authorization and the DG Inspection.[158] The first two departments are not directly related to criminal offences or substance misuse since they are responsible for the correct production and marketing of legal medicines. The DG inspection on the other hand is responsible for all inspection and control activities and is as such responsible for the tracing of abuse and illicit activities. Thus, only this department is of interest to us.

[155] FPS FINANCES, Annual Report 2012, annual numbers: http://www.jaarverslag.financien.belgium.be/nl/archives
[156] FEDERAL BUDGET, FPS Finances (80)-18-06 (p.433).
[157] See http://www.fagg-afmps.be/en/public_information/.
[158] See http://www.fagg-afmps.be/nl/binaries/Annual%20report%202013_tcm290-256626.pdf

In 2012 the FAMHP spent 53,546,359 euros[159] [160] (personnel, operational expenses and investments). 11,372,711 euros can be attributed to the DG Inspection.[161] The FAMHP obtains its funds through three channels[162]: two types of proper income (66.46%) and endowments paid by the FPS Public Heath (33.54%). The own income is made up for 30.25% of contributions[163] and for 69.75% of fees for service.[164]

Department of inspection on Tobacco and Alcohol

(Controledienst tabak en alcohol/Service de contrôle tabac et alcool)

The department of control on tobacco and alcohol aims to protect the population against the harmful effects of tobacco and alcohol.[165] Since January 2010 the Belgian law forbids smoking in all public (closed) spaces such as shopping centres, stations, stores, public transport, but also restaurants and bars etc.[166] Further it is forbidden to sell tobacco products to -16 year olds[167] and advertising for tobacco products is also not allowed[168]. The department of inspection on tobacco and alcohol performs inspections regarding the following:

- Compliance to the general ban on smoking in public spaces;
- The sale of tobacco products to -16 year olds;
- Advertisement and sponsoring;
- Vending machines.

Concerning alcohol, it is forbidden in Belgium to sell alcohol to -16 year old and liquor to -18 year olds.[169] The department of inspection on tobacco and alcohol performs inspections regarding the following:

- The sale of alcohol to minors during public events (bars, parties, festivals etc.);
- The retail sale of alcohol to minors, e.g. (night)shops;
- Vending machines.

[159] FAMHP, Annual Rapport 2013, Brussels, 2013: http://www.fagg-afmps.be/nl/binaries/Annual%20report%202013_tcm290-256626.pdf

[160] This was confirmed in detail by the FAMHP, department Budget and Management Audit, 05/02/2015.

[161] This was calculated by the FAMHP, department Budget and Management Audit, 05/02/2015. This budget includes all expenses of the DG Inspection, thus encompassing all kinds of medication, not only psycho-active medication. This means this estimation is an overestimation.

[162] FAMHP, Annual Rapport 2013, Brussels, 2013: http://www.fagg-afmps.be/nl/binaries/Annual%20report%202013_tcm290-256626.pdf. The percentages for 2012 were calculated by the FAMHP, Department of Budget and Management Audit, 05/02/2015.

[163] The contributions consist of taxes directly collected by the FAMHP, and thus can be seen as an indirect government spending. These taxes are based on the number of packages of medicines and raw materials sold, on the turnover realized from medical devices or the number of MAs.

[164] This means only the income from endowment and contributions can be seen as government spending.

[165] FPS PUBLIC HEALTH, http://health.belgium.be/eportal/Aboutus/ourorganisation/DGforAnimals,PlantsandFoodstuf/Control_Alcohol_Tobacco/index.htm#.VOygvXZXTlw

[166] Law of 22 DECEMBER 2009. – Wet betreffende een algemene regeling voor rookvrije gesloten plaatsen toegankelijk voor het publiek en ter bescherming van werknemers tegen tabaksrook (BS:29-12-2009).

[167] LAW of 19 JULY 2004 - Wet tot wijziging van de wet van 24 januari 1977 betreffende de bescherming van de gezondheid van de verbruikers op het stuk van de voedingsmiddelen en andere producten (BS:10-11-2004).

[168] LAW of 10 DECEMBER 1997 – Wet houdende verbod op de reclame voor tabaksproducten (BS: 01-01-1999).

[169] LAW of 10 DECEMBER 2009 - Wet houdende diverse bepalingen inzake gezondheid (BS: 31-12-2009).

In 2012 **1,000,000 euros** were spent by this department: 250,000 euros (25%) on personnel and operational expenses regarding the sale of alcohol and 750,000 euros (75%) on personnel and operational expenses regarding tobacco products and advertisements.[170]

Belgian Financial Intelligence Processing Unit (CTIF-CFI)

(Cel voor Financiële Informatieverwerking/La Cellule de Traitement des Informations Financières)

The CTIF-CFI is founded as a central organ in the prevention of money laundering and counter-terrorist financing. The CTIF-CFI is in charge of processing suspicious financial facts and transactions linked to money laundering and terrorism financing reported by institutions and individuals specified in the law.[171] These specified individuals and institutions (e.g. process servers, finance companies, exchange offices, notaries etc.) have the duty to report suspicious transactions and facts and cooperate in their detection.

The budget for the CTIF-CFI was 4,924,411 Euros in 2012.[172] This budget is not provided by the Belgian government but compiled by annual contributions of the reporting institutions (law of 11 January 1993). As such the expenditures of the CTIF-CFI are no governmental public expenditures but do form a direct cost to society.

The CTIF-CFI estimates that in 60% of the cases money laundering is a by-product of other criminal activities, like illicit drug trafficking. In 2012 the CTIF-CFI received a total of 21,000 new reported cases. This resulted in 6,124 new dossiers of which 1,506 were handed over to the public prosecutor's office for further prosecution.[173] Of those 1,506 dossiers, 118 (7.84%) were associated with illicit drug trafficking, for a total value of 12.51 million euros.

Also other criminal activities encountered by the CTIF-CFI are of interest to us, since they can partially be attributed to substance misuse. More specifically, we will also include the costs related to crimes of bankruptcy and fraud as property crimes.[174] In 2012, 426 (28.29%) dossiers on fraud and 194 (12.88%) dossier on bankruptcy were handed over to the public prosecutor's office. They represent a value of respectively 429.35 million and 76.69 million euros. The substance attributable fractions for property crimes on the investigation level are used to calculate the alcohol and illicit drugs attributable costs for activities of the CTIF-CFI related to these crimes.

Together this implies a **1,770,666 euros** expenditure for the CTIF-CFI that can be substance misuse attributed for 2012. Table 61 gives an overview.

[170] FPS Public Health, Inspection of alcohol and tobacco.

[171] LAW of 11 JANUARY 1993 -'the prevention of the use of the financial system for the purpose of money laundering and terrorist financing', (BS/09/02/1993). Adapted by the law of 18 January 2010 (BS: 29-10-2010) and the law of 29 March 2012 (BS/06/04/2012). This law applies Directive 2005/60/EC of the European Parliament and the Council of 26 October 2005 on the prevention of the use of the financial system for the purpose of money laundering and terrorist financing' as well as the Commission Directive 2006/70/EC of 1 August 2006 laying down implementing measures for Directive 2005/60/EC of the European Parliament and of the Council.

[172] This information was provided in writing by the CTIF-CFI on 01/04/2015. See also the Royal Order of 11 June 1993 for the composition, organization, workings and independence of the CTIF-CFI, as well as clarification of the practical application of the budget.

[173] When the CTIF-CFI receives additional reports for an already transferred dossier, these reports are added to the already existing transferred dossier. In total (new and additional reports) 5454 reports were handed over to the legal authorities, for a total value of 2.540,96 million euros.

[174] CTIF-CFI, activity report 2012, Brussels 2012: http://www.ctif-fi.be/website/images/NL/annual_report/ctif_ra2012nl_pages.pdf

Table 61: Overview calculation expenditures CTIF-CFI, 2012

Expenditure category	Total budget (euros)	Fraction specific offence	Substance Attributable fraction	Cost (euros)	Proportion
Illicit drug trafficking	4,924,111	7.84%	100%	386,050	21.80%
Crimes bankruptcy ID	4,924,111	12.88%	19.9%	316,479	17.87%
Fraud ID	4,924,111	28.29%	19.9%	695,122	39.26%
Crimes bankruptcy A	4,924,111	12.88%	18.4%	116,697	6.59%
Fraud A	4,924,111	28.29%	18.4%	256,318	14.48%
			TOTAL	1,770,666	100.00%

ID: illicit drugs; A: alcohol

Interpol

Interpol is the world's largest international police organization and has 190 member countries.[175] Each member country maintains a National Central Bureau which is operated by national law enforcement officers. Interpol's operating income totalled 69,589,000 euros in 2012 of which 75% is contributed by member countries.[176] Belgium contributed 955,000 euros in 2012.[177]

Interpol aims to connect police agencies worldwide in order to better fight and prevent (international) crime. In 2012 Interpol carried out 44 operations, coordinated in collaboration with national and regional partner organization.[178] Of those 44 operation, 5 were aimed at illicit drug trafficking (11.36%)[179], 2 were aimed at pharmaceutical crime (4.55%) and 10[180] were aimed at motor vehicles theft (22.72%).

This results in a total expenditure of 231,053 euros as can be seen in Table 62. The substance attributable fractions on the investigation level are used.

Table 62: Overview calculations expenditures Interpol, 2012

Crime phenomenon	Contribution Belgium (euros)	Fraction criminal cases	Substance attributable fraction	Total Cost (euros)	Proportion
Illicit drug trafficking	955,000	11.36%	100%	108,488	46.95%
Pharmaceutical crime	955,000	4.55%	100%	43,453	18.81%
Stolen motor vehicles ID	955,000	22.72%	19,9%	43,178	18.69%
Stolen motor vehicles A	955,000	20.45%	18,4%	35,935	15.55%
			TOTAL	231,053	100.00%

[175] INTERPOL, www.interpol.int
[176] INTERPOL, Annual report 2012, http://www.interpol.int/News-and-media/Publications#n627
[177] FEDERAL BUDGET, FPS Justice (40)-04-03.
[178] INTERPOL, Annual report 2012, http://www.interpol.int/News-and-media/Publications#n627
[179] Including a mixed project aimed at illicit drug trafficking, trafficking human beings and wildlife crime.
[180] Including a mixed project aimed at illicit drug trafficking, trafficking human beings, stolen motor vehicles and firearms.

Federal agency for the safety of the food chain (FASFC)

(Federaal agentschap voor de veiligheid van de voedselketen/Agence fédérale pour la sécurité du chaîne alimentaire)

The FASFC was established by the law of February 2000, and is responsible for the control of all risks within the food chain that can endanger the health of consumers (food safety) but also of animals (animal health) and plants (plants protection). The FASFC is responsible for laying down, implementing and enforcing measures related to these issues.[181] The FASFC performs inspections on safety throughout the entire food chain. One of its responsibilities is the inspection of the compliance to the general ban on smoking in hotels, bars and restaurants, especially when they are located in a public place. In 2012 the FASFC performed a total of 171,522 inspections, of which 10.718 on smoking in public areas.[182] This meant a cost of 11,753,191 euros for the department of inspection smoking. [183]

Summary

To summarize Table 63 gives an overview of all direct substance misuse related costs in the investigation level by type of substance. Tobacco and Psychoactive medication only account for 10% of the costs. The other 90% are almost equally shared by illicit drugs and alcohol, with illicit drugs representing almost half of the total costs (46.84%).

Table 63: Overview substance related expenditures on the investigation level by type of substance, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total
Federal Police	28,866,654	27,123,013	109,128	10,913	56,109,708
Local Police	71,969,876	67,622,659	272,075	27,208	139,891,817
Customs	3,876,500	500,194	375,145	0	4,751,839
FAMHP	0	0	0	11,372,711	11,372,711
Inspection Tobacco/alcohol	0	250,000	750,000	0	1,000,000
CTIF-CFI	1,397,651	373,015	0	0	1,770,666
Interpol	151,666	35,935	0	43,453	231,053
FASFC	0	0	11,753,191	0	11,753,191
Total	106,262,348	95,904,815	13,260,139	11,454,284	**226,880,986**
Proportion	46.84%	42.27%	5.84%	5.05%	100.00%

[181] FASFC, http://www.afsca.be/overhetfavv/

[182] FASFC, Annual Report 2012, http://www.afsca.be/jaarverslagen/

[183] This information was provided in writing by the FPS HEALTH, General Directorate Health Care on 25/09/2015.

2.1.2. Prosecution

Public prosecutor's office *(Openbaar Ministerie/Ministère Public)*

Investigation and prosecution are mainly the responsibility of the public prosecutor's office, which as such forms a link between the executive and judicial body.[184] The public prosecutor's office has responsibilities regarding criminal cases and sometimes, under specific conditions, also civil cases. Only criminal cases are of interest for this study. More specifically, the public prosecutor's office 1) surveys the correct course of action of the criminal proceedings; 2) gathers information and evidence during the criminal investigation; 3) makes decisions about the continuation of the case (dismissal or settlement; further investigation or immediate summon before court) and 4) follows up on the correct proceedings of the court and the execution of sentences.

In order to calculate the correct expenditures linked to this institution the following point has to be kept in mind: there is no specific budget available for the public prosecutor's office on the one hand and the general court on the other hand. The federal budget for 2012 only outlines the realized budget for the joined department of 'legal authorities' (which includes the public prosecutor's office, the general court and the sentencing court). In 2012, the following budget lines were included into the federal budget: staff expenses magistracy (306,569,000)[185], staff expenses administrative and legal personnel (403,320,000)[186] and operational expenses (104,937,000)[187]. This makes a total budget of 814,826,000 euro for the joined legal authorities in 2012.

In order to calculate the share of this budget for the prosecutor's office we look at the proportion of magistracy linked to the public prosecutor's office on the one hand and the general courts and the sentencing court on the other hand. These institutions counted a total number of 2452 magistrates[188], of which 838 (34.18%) belonged to the public prosecutor's office, 1594 (65.01%) belonged to the general court and 20 (0.81%) belonged to the sentencing court.[189] [190]

Since these magistrates deal with both criminal and civil cases, we need to apply a second fraction to determine the share of criminal cases. Since there are no data available on the number of civil cases on the level of public prosecutor's office, we base this fraction on the number of magistrates working for civil or criminal prosecutor's offices.[191] [192] Of the total of 838 magistrates working for the public prosecutor,

[184] See http://www.om-mp.be/.
[185] FEDERAL BUDGET, FPS Justice (56)-00-04.
[186] FEDERAL BUDGET, FPS Justice, (56)-00-01.
[187] FEDERAL BUDGET, FPS Justice (56)-00-02.
[188] These numbers include magistrates that are members of the commission of probation and the commission for the protection of society. Depending on the court they work for, they are members of the public prosecution or general courts. This means costs related to these magistrates (and other personnel) are already incorporated in above calculations. There are no separate costs calculated for these institutions since these functions are an extra responsibility placed on magistrates and as such do not generate extra costs. This information was provided in writing by the FPS JUSTICE, General Directorate, Judicial Order, 31/03/2015.
[189] This information was provided in writing by the FPS JUSTICE, General Directorate, Judicial Order, 17/10/2014.
[190] Since the costs for the sentencing courts are calculated separately, we treat magistracy linked to the sentencing courts as a third category.
[191] This information was verbally provided by the FPS JUSTICE, public prosecutor's office, statistic analysts 24/10/2014.
[192] In previous calculations, this fraction was based on the proportion criminal versus civil cases closed in court (Vander Laenen et al., 2011). However, for criminal cases this would mean a fraction of only 30.15% (infra). This is a highly unlikely estimate for the

727 (86.75%) belonged to the criminal prosecutor's offices[193] and 111 (13.25%) belonged to civil prosecutor's offices.[194] [195]

Third, the share of registered substance law violations and the share of substance attributable non-consensual crimes have to be determined. A total number of 2.439.502 new cases[196] were registered of which 305,022 (12.50%) are property crimes, 87,163 (3.57%) are violent crimes, 11,380 (0.47%) are sexual crimes, 37.250 (1.53%) are drug law violations, 3692 (0.15%) are tobacco law violations, 226 (0.01%) are psychoactive medication law violations and 100 (0.004%) are alcohol law violations[197].[198] New cases include both new and reopened cases.[199] Data for the police prosecutor's office by type of offence are not available. Table 64 gives an overview of the distribution of new cases among the different public prosecutor's offices.

Table 64: Distribution of new cases among the public prosecutor's offices, 2012

	Criminal/Federal	Juvenile (MOF)[200]	Total
Property crimes	281,368	23,645	305,022
Violent crimes	75,798	11,365	87,163
Sexual crimes	9,472	1,908	11,380
Drug law violations	31,579	5,671	37,250
Alcohol law violations	54	46	100

public prosecutor's office, since they only treat a small minority of civil cases, under specific conditions. See also http://www.om-mp.be/page/2289/1/taken_en_opdrachten.html.

[193] This includes the Court of Cassation (Hof van Cassatie/Cour de Cassation), the Courts of Appeal (Hoven van Beroep/Cours d'Appels), the Courts of First Instance (Rechtbanken van Eerste Aanleg/Tribinaux de Premières Instances); Police Courts (Politierechtbanken/tribinaux de Polices); the Federal Prosecutor (Federaal Procureur/Parquet Fédéral) and the Federal Magistrates (Federaal Magistraten/Magistrats Fédérals).

[194] This includes Labour Courts (Arbeidsrechtbanken/Tribunaux du travails); Civil Peace Courts (Vredegerechten/Justice de Paix) and Commercial Courts (Rechtbanken van Koophandel (Tribunaux de Commerces).

[195] This information was provided in writing by the FPS JUSTICE, General Directorate, Judicial Order , 17/10/2014.

[196] FPS JUSTICE, VBSW, Annual statistics on the general courts 2012, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/. FPS JUSTICE, Public Prosecutor's office, Annual Statistics: http://www.om-mp.be/page/152/1/statistieken_van_het_om.html. This includes data on the criminal prosecutor's office, the federal prosecutor's office, the juvenile prosecutor's office and the police prosecutor's office. Data for the correctional, federal and juvenile prosecutor's office (MOF) by offence were provided by FPS JUSTICE, Public Prosecutor's office, statistical analysts on 05/05/2015.Data for the police prosecutor's office by type of offence are not available.

[197] Cases of public intoxication are handled by the police prosecutor's office. However, there are no data available by type of offence for the police prosecutor's office. Only cases that by exception flow from the police prosecutor's office to the criminal prosecutor's office can be counted, which is only a very small minority (47 + 25). Since the majority of alcohol law violations concern public intoxication, this means a serious underestimation of the number of alcohol law violations on the prosecution level (100).Therefore the calculation of the alcohol law violations costs is a serious underestimation. This information was provided in writing by the FPS JUSTICE, Public Prosecutor's office, statistical analysts on 05/05/2015.

[198] Concerning the data on the juvenile prosecutor's office, only data on the number of new juvenile offences (MOF) could be included, since data on the distribution by offence for the number of new worrisome living situations (VOS) are not available. This information was verbally provided by the FPS JUSTICE, Statistical analysts, 24/10/2014.

[199] For the juvenile prosecutor's office, only new, and not reopened cases, are taken into account since there is no information available on closed cases (and thus neither on possible reopened cases). Only the primary charges are taken into account. For the criminal and federal prosecutor's office a 'case' is independent of the number of involved suspects. For the juvenile prosecutor's office, a 'case' refers to one minor in one case. If several minors are involved in the same case, these are counted separately for every minor involved. If one minor is involved in several cases, these cases are also counted separately. This information is provided in writing by the FPS JUSTICE, Public prosecutor's office Statistical analysts, 05/05/2015.

[200] Only including cases regarding minors who have committed an offence (MOF).

Tobacco law violations	3648	44	3692
Psychoactive medication law violations	219	7	226

Next the substance misuse attributable fractions on the prosecution level are applied. To summarize, this means the following fractions are used to determine the substance attributable costs for the public prosecutor's office: 34.18% as fraction public prosecutor's office; 86.75% as fraction criminal cases; 12.50% as fraction property crimes, 3.57% as fraction violent crimes, 0.47% as fraction sexual crimes, 1.53% as fraction drug law violations, 0.004% as fraction alcohol law violations, 0.15% as fraction tobacco law violations and 0.01% as fraction psychoactive medication law violations, followed by the appropriate substance misuse attributable fractions at the investigation level. This results in a total cost of **84,015,820 euros**. Table 65 gives an overview of the calculations.

Table 65: Overview calculation expenditures public prosecutor's office, 2012

Expenditure category	Total budget (in euros)	Fraction public prosecutor	Fraction criminal cases	Fraction specific offence	Substance Attributable fraction	Total (euros)	Proportion
Illicit drug law violations	814,826,000	34.18%	86.75%	1.53%	100%	3,696,561	4.40%
Alcohol law violations	814,826,000	34.18%	86.75%	0.004%	100%	9,664	0.01%
Tobacco law violations	814,826,000	34.18%	86.75%	0.15%	100%	362,408	0.43%
Psych. medication law violations	814,826,000	34.18%	86.75%	0.01%	100%	24,161	0.03%
Property crime ID	814,826,000	34.18%	86.75%	12.50%	24.4%	30,200,660	35.95%
Violent crime ID	814,826,000	34.18%	86.75%	3.57%	9.0%	8,625,308	10.27%
Sexual crime ID	814,826,000	34.18%	86.75%	0.47%	17.7%	1,135,545	1.35%
Property crime A	814,826,000	34.18%	86.75%	12.50%	18.4%	30,200,660	35.95%
Violent crime A	814,826,000	34.18%	86.75%	3.57%	33.2%	8,625,308	10.27%
Sexual crime A	814,826,000	34.18%	86.75%	0.47%	26.2%	1,135,545	1.35%
					TOTAL	**84,015,820**	100.00%

ID: illicit drugs; A: alcohol

Summary

To summarize, Table 66 gives an overview of all substance related expenses on the investigation level, by type of substance. Together, alcohol (47.58%) and illicit drugs (51.96%) are responsible for 99.54% of the total amount.

Table 66: Overview substance related expenditures on the prosecution level by type of substance, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total
Public prosecutor's office	43,658,074	39,971,177	362,408	24,161	84,015,820
Total	43,658,074	39,971,177	362,408	24,161	84,015,820
Proportion	51.96%	47.58%	0.43%	0.03%	100.00%

2.1.3. Sentencing

General Courts (Rechtbanken/Tribunaux)

The same procedure as for the calculation of the public prosecutor's expenditures is followed. Again we start from the realized budget for the joined 'legal authorities' as outlined in the federal budget. Only this time, not the share for the public prosecutor's office is calculated but the share for the general courts. Next we calculate the share of criminal cases, and its share of relevant cases (substance law violations and substance attributable non-consensual crimes). For these calculations, we use the number of closed cases by the general courts instead of the number of new cases.[201] In this case, the choice for closed cases is necessary because there are no data available on the number of new criminal cases by type of offence for the police courts, courts of Assizes, the indictment division and the juvenile court. Furthermore, because there are no data available by type of offence for the majority of all courts (new or closed cases), we use statistics on the number of convictions for 2012 to determine the share of costs attributable to specific offences. These statistics imply closed cases. Finally the substance misuse attributable fractions on the sentencing level will be applied.

In 2012 the federal budget mentions a realized budget for the joined 'legal authorities' of 306,569,000 euros on the staff expenses for the magistracy[202], 403,320,000 euros on staff expenses for administrative and legal personnel[203] and 104,937,000 euros for operational expenses.[204] This makes a total budget of 841,826,000 euros. Of the 2452 magistrates linked to both the public prosecutor's office and the general courts, 1,604 (65.01%) belonged to the general courts.[205] This means 547,271,083 euros can be linked to the general courts.

[201] We expect the difference in outcome to be minimal since there is only a small difference between the number of closed and new cases reported by those courts who include both in their statistics.
[202] FEDERAL BUDGET FPS Justice (56)-00-04.
[203] FEDERAL BUDGET, FPS Justice (56)-00-01.
[204] FEDERAL BUDGET, FPS Justice, (56)-00-02.
[205] This information was provided in writing by the FPS JUSTICE, General Directorate Judicial Order , 17/10/2014

Next we need to determine the proportion of criminal cases. In 2012 the general courts closed[206] a total of 1,195,745 cases[207] of which 360,599 (30.16%) were criminal cases.[208] Table 67 gives an overview of the distribution of these criminal cases among the different courts. There are no data available on the number of criminal cases (new or closed) for the juvenile courts.[209] This means the total number of closed (criminal) cases is an underestimation of the real number of cases closed by the general courts.

Table 67: Number of criminal cases closed by the general courts, 2012

	Criminal courts	Police court	Courts of appeal	Juvenile Court	Juvenile Court of appeal (VOS)[210]	Indictment division	Pre-trial chamber	Court of assizes	Total
Criminal cases closed	52,103	267,857	6,911[211]	NA	1,293	10,712	21,638[212]	85	360,599
%	14.45	74.28	1.92	NA	0.36	2.97	6.00	0.02	100

Third, the share of registered substance law violations and the share of substance attributable non-consensual crimes have to be determined. Since there are no data available on the distribution of closed cases according to different types of crime for all courts,[213] statistics on the number of convictions for 2012 are used.[214] In 2012, Belgian courts reported so far 283,758 convictions, of which 270,059 effective convictions[215], 755 internments and 12,944 suspensions of sentence.[216]

Table 68 shows that 5.68 % of these convictions were for violent crimes; 0.52% for sexual crimes; 6.79% for property crimes; 1.84% for drug law violations; 0.29% for alcohol law violations; 0.01% for tobacco law violations; 0.48% for psycho-active medication law violations and 0.13 % for both drug law and psycho-active medication law violations (other).

[206] A final verdict (judgment, dismissal, joinder) was reached.
[207] Numbers for the Labour Court are based on data from 2009.
[208] FPS JUSTICE, VBSW, Kerncijfers van de gerechtelijke activiteit 2000-2012, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/. These data were verbally confirmed and corrected where needed by the VBSW, 18/11/2014.
[209] This information was verbally provided by the FPS JUSTICE, VBSW, 18/11/2014.
[210] Only including cases regarding worrisome living situations (VOS).
[211] This number is based on data in the FPS JUSTICE, VBSW, Annual Statistics, 2012, Courts of Appeal, Criminal cases, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/2012/. The number mentioned in this publication contains both social and correctional cases. Filtering out correctional cases, 6911 closed cases are left. This information was verbally provided by the FPS JUSTICE, 18/11/2014.
[212] This number was is based on data provided in FPS JUSTICE, VBSW, Annual Statistics, 2012, Criminal court, Criminal cases, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/2012/. The registration by the Pre-trial chamber themselves is done manually causing incomplete results. This information was verbally provided by the FPS JUSTICE, VBSW, 18/11/2012.
[213] This information was verbally provided by the FPS JUSTICE, VBSW, 18/11/2014.
[214] These numbers are also an underestimation. Because of a backlog in registration available numbers are only up to date until 2005. The numbers reported here are based on a data extraction at the end of 2014 and may have changed since. See also http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=28&Itemid=47&lang=dutch.
[215] Convictions include the following punishing decisions: incarceration, conditional incarceration, community service, financial penalty and driving disqualification.
[216] FPS JUSTICE, Department of Criminal Policy, Convictions, internments and suspensions: http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=28&Itemid=47&lang=dutch

Table 68: Convictions according to type of crime, 2012[217]

	Effective convictions	Internments	Suspensions	total	Proportion
Violent crimes	14,061	154	1,905	16,120	5.68%
Sexual crimes	1,305	59	115	1,479	0.52%
Property crimes	17,732	144	1,403	19,279	6.79%
Illicit drug law violations	4,673	19	539	5,231	1.84%
Alcohol law violations	812	1	21	834	0.29%
Tobacco law violations	32	0	0	32	0.01%
Psycho-active medication law violations	1,199	12	144	1,355	0.48%
Other (Illicit drugs and medication)	316	1	46	363	0.13%

Finally we need to use the appropriate substance attributable fractions. This results in a total cost of **13,247,362 euros**, as can be seen in Table 69.

Table 69: Overview calculations expenditures general courts , 2012

Expenditure category	Total budget (euros)	Fraction general courts	Fraction criminal cases	Fraction specific offence	Substance Attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	841,826,000	65.01%	30.16%	1.84%	100%	2,939,640	0
Alcohol law violations	841,826,000	65.01%	30.16%	0.29%	100%	463,313	3.50%
Tobacco law violations	841,826,000	65.01%	30.16%	0.01%	100%	15,976	0.12%
Psych. medication law violations	841,826,000	65.01%	30.16%	0.48%	100%	766,863	5.79%
Other (ID and/or medication)	841,826,000	65.01%	30.16%	0.13%[218]	100%	207,692	1.57%
Property crime ID	841,826,000	65.01%	30.16%	6.79%	35.9%	3,894,400	29.40%
Violent crime ID	841,826,000	65.01%	30.16%	5.68%	13.2%	1,197,840	9.04%
Sexual crime ID	841,826,000	65.01%	30.16%	0.52%	26.0%	216,000	1.63%
Property crime A	841,826,000	65.01%	30.16%	6.79%	12.5%	1,355,989	10.24%
Violent crime A	841,826,000	65.01%	30.16%	5.68%	22.5%	2,041,772	15.41%
Sexual crime A	841,826,000	65.01%	30.16%	0.52%	17.8%	147,877	1.12%
					TOTAL	13,247,362	100.00%

ID: illicit drugs; A: alcohol

[217] FPS JUSTICE, Department of Criminal Policy, Convictions, internments and suspensions: http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=28&Itemid=47&lang=dutch

[218] For this attributable fraction we took the mean of the attributable fractions for illicit drug law violations and psychoactive medication law violations.

Legal aid *(Gerechtelijke bijstand/Aide judicaire)*

Every individual that is impecunious or has no sufficient income is given access to (free) legal aid. [219] According to the federal budget 86,797,000 euros were spent on legal aid in 2012.[220] The already mentioned fractions are applied to calculate the share of this expenditures attributable to substance misuse. Again the substance attributable fractions on the sentencing level are used. This results in a total cost of **2,170,646 euros**, as is show in Table 70.

Table 70: Overview calculation expenditures legal aid, 2012

Expenditure category	Total budget (euros)	Fraction criminal cases	Fraction specific offence	Substance Attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	86,797,000	30.16%	1.84%	100%	481,675	22.19%
Alcohol law violations	86,797,000	30.16%	0.29%	100%	75,916	3.50%
Tobacco law violations	86,797,000	30.16%	0.01%	100%	2,618	0.12%
Psych. Medication law violations	86,797,000	30.16%	0.48%	100%	125,654	5.79%
Other (ID and medication)	86,797,000	30.16%	0.13%	100%	34,031	1.57%
Property crime ID	86,797,000	30.16%	6.79%	35.9%	638,117	29.40%
Violent crime ID	86,797,000	30.16%	5.68%	13.2%	196,272	9.04%
Sexual crime ID	86,797,000	30.16%	0.52%	26.0%	35,393	1.63%
Property crime A	86,797,000	30.16%	6.79%	12.5%	222,186	10.24%
Violent crime A	86,797,000	30.16%	5.68%	22.5%	334,555	15.41%
Sexual crime A	86,797,000	30.16%	0.52%	17.8%	24,230	1.12%
				TOTAL	2,170,646	100.00%

ID: illicit drugs; A: alcohol

Legal expenses *(Gerechtskosten/Frais judiciaires)*

In order to investigate (possible) violations of law, the justice system has to spend money on activities that make this possible like expert analyses, experts at trial, clinical research, intercepting telephone call. In 2012 a total of 89,893,000 euros was spent on this kind of activities.[221]

Of this amount, 512,125 euros were spent on lab tests detecting illicit drugs, 671,526.69 euros on lab tests detecting alcohol in blood; 117,328.47 euros on lab tests detecting illicit drugs in urine; 361,166.30 on lab tests analysing powders and other pharmaceutical materials; 307,609.53 euros on clinical research detecting blood alcohol levels; 8,019.19 euros on clinical research detecting illicit drugs in blood; 83.63

[219] Artikel 23, derde lid, 3° Grondwet
[220] FEDERAL BUDGET 2012, FPS Justice (56)-01.
[221] FEDERAL BUDGET 2012, FPS Justice (56)-00- 03.

euros on clinical research detecting illicit drugs in urine and 408,190.61 euros on the liquidation of illicit drugs. [222] [223]

This means an expenditure of 637,557 euros on illicit drugs related analyses, 979,136 euros on alcohol related analyses; 361,166 euros for the detection of pharmaceuticals and 408,191 for the elimination of illicit drugs. Together this makes for a total expenditure of **2,386,050** euros.

Drug Treatment Court (Drugsbehandelingskamer)

Following the Proefzorg project, the project Drug Treatment Court was launched in 2008. This project provides a specialized chamber within the criminal Court of Ghent for the trial of drug law violations and non-organized illicit drug related crime which is based on problems of addiction and dependence on the side of the defended.

In 2012 PopovGGz also coordinated the provided care and assistance and organized meetings for the different steering committees. Two part-time liaisons are employed on this project by PopovGGz, but were officially on the payroll of the FPS Justice. The total budget for the liaisons (personnel and operational expenditures) was 100.000 euros in 2012. The region further provided PopovGGz with a budget of 64.000 euros intended for coordination of PopovGGz as a whole, including the Drug treatment court project.[224]

Summary

To summarize, Table 71 gives an overview of all substance related expenses on the sentencing level, by type of substance. Illicit drug use generates the largest expenses (60.16%), followed by alcohol (31.42). Still, psychoactive medication is also an important cost category (6.98%).

Table 71: Overview substance attributable expenditures on the sentencing level by type of substance, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Other (Illicit drugs and medication)	Total
General Courts	8,247,880	4,008,951	15,976	766,863	207,692	13,247,362
Legal aid	1,351,456	656,887	2618	125,654	34,031	2,170,646
Legal expenses	1,045,748	979,136	0	361,166	0	2,386,050
Drug treatment Court	164,000	0	0	0	0	164,000
Total	10,809,084	5,644,973	18,594	1,253,683	241,723	**17,968,058**
Proportion	60.16%	31.42%	0.10%	6.98%	1.35%	100.00%

[222] This information was provided in writing by the General Directorate 'Judicial Order, 11/12/2014.

[223] Lab tests and clinical research detecting alcohol and illicit drugs do also occur in case of traffic violations. Since it is not possible to distinguish the expenses for traffic related tests from others, we chose to report the entire cost under this section. This information was provided in writing by the General Directorate 'Judicial Order' on 13/06/2015.

[224] This information was provided in writing by PopovGGZ, 16/02/2015.

2.1.4. Sentence Execution

Penitentiary Institutions (Gevangenissen/prisons)

Ideally the number of detention days for a specific offence is multiplied by the average costs of one day of detention. However, it is not possible to use this formula to calculate the substance misuse attributable costs for Belgian penitentiary institutions since data on the number of detention days for each specific offence are not available.[225] In this case Vander Laenen et al. (2011) recommend in an earlier study on the governmental spending of illicit drugs, to use the method Fournier (1981). This method uses the annual number of incarcerations and the population on a given date (March 1st 2012). In order to avoid overlap when calculating the costs we use a minimum and a maximum estimation of the total expenditure. The minimum calculation only takes incarcerations into account for a single offence (e.g. only a violent crime). The maximum calculation takes incarcerations into account for a specific offence among other offences (e.g. a violent crime and a property crime).[226] With these data the (minimum and maximum) average duration of detention can be calculated for each offence, using the following formula (see Table 72).

$$\frac{\text{Population specific offence march 1st 2012}}{\text{Number of incarcerations specific offence 2012}} * 366$$

Table 72: Calculation of average duration of detention (in days) by type of offence, 2012[227]

	Min Drug law violation	Max Drug law violation	Min alcohol law violation	Max alcohol law violation	Min Tobacco law violation	Max tobacco law violation	Min med law violation	Max. med. Law violation	Min violent crime	Max violent crime	Min property crime	Max Property crime	Min sexual crime	Max sexual crime
Population March 1st	1062	2354	0	37	0	0	0	33	498	2467	597	4108	520	1015
Incarcerations 2012	2549	4247	5	24	0	6	0	15	984	2795	3019	8262	445	780
Average duration detention	152.49	202.86	0.00	564.25	0	0.00	0	805.20	185.23	323.05	72.38	181.98	427.69	476.27

Next the costs for the correctional facilities can be estimated by multiplying the average duration of detention for each offence by the number of incarcerations for that offence, the average costs of one day of detention and finally the substance misuse attributable fraction for that offence. Table 20 and 21 give an overview of the calculations. The average cost of one day of detention is estimated at 136.84 euros.[228]

[225] This information was provided in writing by the FPS JUSTICE, General Directorate of Penitentiary Institutions, Department of Management Information, 21/10/2014.

[226] Because we calculate the costs for different offences at the same time, the maximum estimation still entails the risk of overlapping costs. The maximum estimation for violent crimes might for example entail costs associated with incarcerations for violent crimes and drug law violations. This means an overlap with the maximum estimation for drug law violations, which may also entail violent crimes. To minimize this overlap, incarcerations including substance law violations are excluded from the maximum calculation of violent, property and sexual crimes.

[227] These data were provided in writing by the FPS JUSTICE, General Directorate of Penitentiary Institutions, Department of Information Management, 10/072015.

[228] This number was provided in writing by the FPS JUSTICE, General Directorate of Correctional Facilities, Department of Information Management, 10/04/2015. This estimate includes the cost of regular incarceration, internments and incarcerations at the Dutch prison of Tilburg. The calculation is based on the federal budget 2012 and the average day-population.

These calculations indicate that the substance attributable expenditures for penitentiary institutions can be situated between 89,024,016 euros and 291,938,425 euros.[229]

In both the minimum and maximum estimation we see the largest spending on illicit drug law violations. Looking at the substance attributable non-consensual crimes, we see that in general illicit drug related crimes generate the largest expenses, especially for property crimes, but alcohol related violent crimes generate more expenses compared to illicit drug related violent crimes.

Table 73: Overview minimum calculation expenditures incarceration, 2012

Expenditure category	Average duration of detention (days)	Number of incarcerations	Average cost for 1 day of detention (Euro)	Substance misuse attributable fraction	Total cost	Proportion
Illicit drug law violations	152.49	2549	136.84	100%	53,188,613	59.75%
Alcohol law violations	0.00	5	136.84	100%	0	0.00%
Tobacco law violations	0.00	0	136.84	100%	0	0.00%
Psych. medication law violations	0.00	0	136.84	100%	0	0.00%
Property crime ID	72.38	3019	136.84	35.7%	10,674,233	11.99%
Violent crime ID	185.23	984	136.84	13.1%	3,267,343	3.67%
Sexual crime ID	427.69	445	136.84	25.9%	6,745,238	7.58%
Property crime A	72.38	3019	136.84	13.5%	4,036,475	4.53%
Violent crime A	185.23	984	136.84	24.4%	6,085,739	6.84%
Sexual crime A	427.69	445	136.84	19.3%	5,026,374	5.65%
		TOTAL			89,024,016	100,00%

ID: illicit drugs; A: alcohol

Table 74: Overview maximum calculation expenditures incarceration, 2012

Expenditure category	Average duration of detention	Number of incarcerations	Average cost for 1 day of detention	Substance misuse attributable fraction	Total cost	Proportion
Illicit drug law violations	202.86	4247	136.84	100%	117,896,418	40.38%
Alcohol law violations	564.25	24	136.84	100%	1,853,087	0.63%
Tobacco law violations	0.00	6	136.84	100%	0	0.00%

[229] An alternative calculation, using a total budget for the Belgian penitentiary institutions in 2012, can be found in the SWOT-analysis. This calculations gives similar results.

Psych. medication law violations	805.20	15	136.84	100%	1,652,754	0.57%
Property crime ID	181.98	8262	136.84	35.7%	73,450,169	25.16%
Violent crime ID	323.05	2795	136.84	13.1%	16,185,816	5.54%
Sexual crime ID	476.27	780	136.84	25.9%	13,166,185	4.51%
Property crime A	181.98	8262	136.84	13.5%	27,775,274	9.51%
Violent crime A	323.05	2795	136.84	24.4%	30,147,627	10.33%
Sexual crime A	476.27	780	136.84	19.3%	9,811,095	3.36%
				TOTAL	291,938,425	100.00%

ID: illicit drugs; A: alcohol

Community youth institutions

(Gemeenschapsinstellingen/Institutions publiques de protection de la jeunesse)

The juvenile court can place a minor in a community youth institution when he committed an offence (MOF) or finds himself in a worrisome living situation (VOS). [230] This can be in an open facility (minimum 12 years of age) or in a closed facility (minimum 14 years of age). [231]

It is not possible to calculate addictive substance abuse related costs for the **Dutch speaking youth institutions**, since there are no data available on the number of youth directed to one of these institutions by type of offence.[232]

The **French speaking community** counted 5 community institutions in 2012: Jumet, Wauthier-Braine, Braine-le-Chateau, Fraipont and Saint-Gervais. In 2012 the total expenses for these institutions, including the federal youth institution Saint-Hubert, combined were 42,118,666.86 euros. Of those expenses 4,003,898 euros were managed by the administration of youth welfare (Aide à la Jeunesse), for operational costs (energy costs, consumption costs, etc.),[233] 36,191,196 euros were managed by the administration of Public Functioning (function publique) for personnel costs, and 1,923,572.86 euros was managed by the administration of Infrastructure.[234]

[230] FLEMISH GOVERNMENT, Youth Welfare (Jongerenwelzijn), Community Institutions, https://wvg.vlaanderen.be/jongerenwelzijn/jeugdhulp/publieke-jeugdinstellingen/gemeenschapsinstellingen/

[231] For more information, see also the website of 'Juvenile Justice': http://www.jeugdrecht.be/?action=artikel_detail&artikel=256

[232] This information was provided in writing by the FLEMISH GOVERNMENT, Youth Welfare (Jongerenwelzijn), Department of community institutions, 24/03/2015 and 25/03/2015.

[233] This information was provided in writing by the FEDERATION WALLONIA-BRUSSELS, General Directorate of youth welfare (Aide à la Jeunesse) on 13/04/2015.

[234] This information was provided in writing by the FEDERATION WALLONIA-BRUSSELS, Directorate of Research on 22/04/2015.

These community institutions, together with the federal institution of Saint-Hubert, reported a total of 2,412 offences in 2012.[235] Of those, 1,205 (49.96%) were property crimes; 424 (17.58%) were violent crimes, 112 (4.64%) were sexual crimes and 302 (12.52%) were drug law violations. When applying the substance attributable fractions on the sentence execution level, a total expenditure of **19,286,180 euro** can be noted. See Table 75.

Table 75: Overview calculation expenditures French community youth institutions (including Saint-Hubert), 2012

Expenditure category	Total Budget (euros)	Fraction specific offence	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	42,118,666.86	12.52%	100%	5,273,257	27.34%
Property crime ID	42,118,666.86	49.96%	35.7%	7,512,167	38.95%
Violent crime ID	42,118,666.86	17.58%	13.1%	969,984	5.03%
Sexual crime ID	42,118,666.86	4.64%	25.9%	506,165	2.62%
Property crime A	42,118,666.86	49.96%	13.5%	2,840,736	14.73%
Violent crime A	42,118,666.86	17.58%	24.4%	1,806,689	9.37%
Sexual crime A	42,118,666.86	4.64%	19.3%	377,181	1.96%
			TOTAL	19,286,180	100.00%

ID: illicit drugs; A: alcohol

Specific projects *(specifieke projecten/projets spécifiques)*

The General Directorate of Penitentiary Institutions (DG EPI) organizes some specific projects and activities concerning illicit drug use.[236] In total **828,453.68 euros** were spent by the DG EPI for those activities (including Centraal Aanmeldpunt (CAP or the 'Central Registration Point') and Step by Step).[237] In 2012 the following projects were organized:[238]

Table 76: Project and activities organized related to illicit drugs, organized by the DG EPI, 2012

Step by Step CAP	All	Central contact point for illicit drug users who want to tackle their drug abuse problems in preparation for their release. Specialized teams in each prison.
B-Leave	Ruislede	8 month programme that helps detainees to become illicit drug free during their detention and maintain that way once they leave prison. A strict daily routine is followed and social and personal skills are enforced. Therapeutic guidance.

[235] This information was the FEDERATION WALLONIA-BRUSSELS, General Directorate of youth welfare (Aide à la Jeunesse) on 24/04/2015.

[236] FPS JUSTICE, DG EPI, http://justitie.belgium.be/nl/themas_en_dossiers/gevangenissen/leven_in_de_gevangenis/drugsbeleid/drugsprogramma_s_voor_gedetineerden/

[237] This information was provided in writing by the FPS JUSTICE, DG EPI, on 08/05/2015 and 11/05/2015

[238] FPS JUSTICE, http://justitie.belgium.be/nl/themas_en_dossiers/gevangenissen/leven_in_de_gevangenis/drugsbeleid/drugsprogramma_s_voor_gedetineerden/ and FPS JUSTICE, DG EPI, Annual Report 2012, http://justitie.belgium.be/nl/binaries/jaarverslag%20nl_spread_tcm265-225153.pdf

Schakels	Ruislede	Follow up programme for B-leave.
D-side	Brugge	Drug free wing for detainees who want to stop using illicit drugs during their stay in prison and don't want to be confronted with illicit drugs. A strict daily routine is followed, regular drug testing is mandatory, and social and personal skills are enforced. Therapeutic guidance.
KDP	Brugge	(Kortdurend Drugs Programma/Short Drugs Program) Short programmes aiming at raising awareness of the negative consequences of illicit drugs use and motivating detainees to stop using.
Boule de Neige	Walloon prisons	Detainees are trained as 'illicit drugs prevention officers'.
Détenus Contact Santé	Walloon prisons	Detainees are trained as health officers, and inform in turn other detainees. They serve as a contact point between detainees and the Détenus Contact Point.
Prévenez-vous	Walloon prisons	3 month programme that helps detainees to bring structure and balance in their lives and stay away from addictive substances.
Others		Information sessions for staff

Next to these illicit drug-specific project the DG EPI also funds three support centers for the treatment and guidance of sexual offenders (Unité de Psychopathologie Légale; Universitair Forensisch Centrum and Centre d'Appui Bruxellois). Their specific activities are determined by agreement between the federal government and the communities. In 2012 893,000 euros were spent on these centers by the federal government.[239] Applying the substance attributable fractions of the sentence execution level, this means an expenditure of 403,636 euros (231,287 euros for illicit drugs attributable sexual crimes and 172,349 euros for alcohol attributable sexual crimes).
However, these costs are already incorporated into the federal budget for the penitentiary institutions and thus also into the calculation of the substance attributable expenditures for these institutions.[240] Therefore these expenditures are not counted separately.

Houses of Justice (Justitiehuizen/Maisons de justices)
Houses of Justice support services for both the legal authorities and defendants/offenders.[241] More specifically they:

- Provide information to the administrative and legal authorities in Belgium;
- Guide defendants and offenders during the implementation of the penalty or measurements ordered by the court;
- Inform and provide assistance to victims of crime;
- Inform the citizen.

In 2012, there were 28 Houses of Justice in Belgium. The expenditures linked to them in 2012 are calculated based on the number of new mandates taken on by judicial assistants in 2012. These mandates comprise activities in 5 different categories: 1) social surveys and advisory reports[242], 2) guidance of

[239] This information was provided in writing by the FPS JUSTICE, DG EPI, on 08/05/2015 and 11/05/2015.
[240] The average costs of 1 day of detention is calculated based on the federal budget and the average daily population.
[241] FPS JUSTICE, http://justitie.belgium.be/nl/themas_en_dossiers/justitiehuizen/.
[242] Maatschappelijke enquêtes en voorlichtingsrapporten (Enquête sociale et rapport d'information succinct)

offenders[243], 3) civil cases, 4) primary care[244] and 5) victim support.[245] For this study only the mandates concerning guidance of offenders will be estimated (cf. Infra). In 2012 there were a total of 58.457 mandates of which 28.355 (48,51%) were guidance of offender cases.[246] [247] An overview of these mandates can be found in Table 77.

Table 77: Overview mandates 'guidance of offenders', 2012[248]

Type of guidance	New mandates	New mandates drug law violations	New mandates property crimes	New mandates violent crimes	New mandates sexual crimes
Conditional release[249]	4,495	1,108	1,360	1,334	283
Probation[250]	6,231	1,345	1,115	1,705	481
Community service[251]	9,556	1,055	2,763	1,955	19
Penitentiary guidance[252]	1,717	304	518	490	157
Mediation in criminal cases[253]	6,356	346	1,732	3,217	148
TOTAL	**28,355 (100%)**	4,158 (14.66%)	7,488 (26.41%)	8,701 (30.69%)	1,088 (3.84%)

In 2012, 59,682,000 euros were spent by the Houses of Justice.[254] Applying the fractions calculated above and the substance attributable fractions on the sentence execution level, this means a total expenditure of **11,840,725 euros**. An overview of these calculations can be found in Table 78.

[243] Daderbegeleiding (La surveillance d'auteurs)
[244] Eerstelijnswerking (Accueil social de première ligne)
[245] Slachtofferonthaal (Le service d'accueil des victimes)
[246] FPS JUSTICE, Houses of Justice, Annual Activity Rapport 2012, http://justitie.belgium.be/nl/binaries/Jaarverslag_tcm265-226241.pdf; these data were provided in writing by the FPS Justice, General Directorate 'Houses of Justice', 01/12/2014.
[247] The number of mandates concerning electronic surveillance (ankle bracelet) are excluded (7200) since these costs are calculated in a separate category.
[248] FPS JUSTICE, Houses of Justice, Annual Activity Rapport 2012, http://justitie.belgium.be/nl/binaries/Jaarverslag_tcm265-226241.pdf; these data were provided in writing by the FPS JUSTICE, General Directorate 'Houses of Justice', 01/12/2014.
[249] Vrijheid onder voorwaarden/Liberté sous conditions
[250] Probatie/suspension probatoire
[251] Autonome werkstraf/peine de travaille autonome
[252] Penitentiaire begeleiding/l'accompagnement pénitentiaires
[253] Bemiddeling in strafzaken/Médiation pénale
[254] FEDERAL BUDGET, FPS Justice (52) 00 (-03 excluded).

Table 78: Calculation of expenditures 'houses of justice', 2012

Expenditure category	Total Budget (euros)	Fraction 'Guidance of Offenders'	Fraction specific offence	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	59,682,000	48.51%	14,66%	100%	4,244,325	35.85%
Property crime ID	59,682,000	48.51%	26,41%	35.7%	2,729,677	23.05%
Violent crime ID	59,682,000	48.51%	30,69%	13.1%	1,163,973	9.83%
Sexual crime ID	59,682,000	48.51%	3,84%	25.9%	287,942	2.43%
Property crime A	59,682,000	48.51%	26,41%	13.5%	1,032,231	8.72%
Violent crime A	59,682,000	48.51%	30,69%	24.4%	2,168,010	18.31%
Sexual crime A	59,682,000	48.51%	3,84%	19.3%	214,567	1.81%
				TOTAL	11,840,725	100.00%

This calculation contains some errors:

1) As mentioned, only the mandates concerning 'guidance of offenders' are used in the calculations. Applications for social surveys and advisory reports are excluded, since there is no data available on the distribution by offence.[255]
2) Offences against alcohol, tobacco or psychoactive medication laws are not included, because these specific offences are not registered separately (see also Van der Laenen et al., 2011).
3) The calculations are based on the number of new mandates. However, one mandate can be linked to several offences. This means some mandates are counted double, if they include several offences.

Electronic Surveillance and NCET *(Electronisch toezicht/ Surveillance électronique)*

In 2012 the FPS Justice spent 6,204,000 euros on electronic surveillance.[256] The houses of Justice counted a total of 7,200 new mandates of electronic surveillance, of which 3,239 (44.99%) fell under 'guidance of offenders'.[257] More specifically, 912 (28.16%) were related to violent crimes; 1,252 (38.65%) were related to property crimes; 86 (2.66%) were related to sexual crimes and 714 (22.04%) were related to illicit drug law violations. As is shown in Table 79, this results in a total expenditure of **1,474,249 euros**. Substance attributable fraction on the sentence execution level are used.

[255] This information was provided in writing by the FPS JUSTICE, general Directorate 'Houses of Justice', 05/01/2014.
[256] FEDERAL BUDGET, FPS Justice (52) 01
[257] FPS JUSTICE, HOUSES OF JUSTICE, Annual Activity Rapport 2012, http://justitie.belgium.be/nl/binaries/Jaarverslag_tcm265-226241.pdf; these data were provided in writing by the General Directorate 'Houses of Justice', 01/12/2014.

Table 79: Overview calculations expenditures electronic surveillance, 2012

Expenditure category	Total Budget (euros)	Fraction 'Guidance of Offenders'	Fraction specific offence	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	6,204,000	44.99%	22,04%	100%	615,176	41.73%
Property crime ID	6,204,000	44.99%	38,65%	35.7%	385,128	26.12%
Violent crime ID	6,204,000	44.99%	28,16%	13.1%	102,965	6.98%
Sexual crime ID	6,204,000	44.99%	2,66%	25.9%	19,230	1.30%
Property crime A	6,204,000	44.99%	38,65%	13.5%	145,637	9.88%
Violent crime A	6,204,000	44.99%	28,16%	24.4%	191,783	13.01%
Sexual crime A	6,204,000	44.99%	2,66%	19.3%	14,329	0.97%
				TOTAL	1,474,249	100.00%

The NCET or the National Centre of Electronic Surveillance, is part of the Houses of Justice and is responsible for coordinating, monitoring and implementing all measures involving some kind of electronic surveillance. This means that they are responsible for all dossiers electronic surveillance. In most cases, there is additional support from the houses of justice themselves, in other cases (e.g. home detention) solely the NCET is responsible. Since there are no data available by specific offence, these cases are not included in the above calculations.[258] Because the NCET is part of the Houses of Justice, and thus share the same budget, the relevant expenditures are already included in the calculations above.[259]

Sentencing court (*Strafuitvoeringsrechtbank/Tribunal de l'application des peines)*

Belgian sentencing courts (SURB) are part of the courts of first instance, next to the civil court, the criminal court and the juvenile court. They are responsible for the execution of penalties and measures ordered by these and other courts, of more than 3 years. There are 5 sentencing courts in Belgium. Each sentencing court consists of one chairman, two sentencing judges (SUR) and two assessors.

In 2012 they were competent in two domains:

- Sentencing modalities (restricted detention, electronic surveillance, conditional release, temporary release). These modalities are granted by a sentencing judge in case of sentences up to three years, and by the sentencing court in case of a sentence of more than three years.
- Placement at the disposal of the authorities

The 2012 budget for the sentencing courts is incorporated into the budget for the joined department of legal authorities.[260] In 2012 the legal authorities had a total budget of 306.569.000 euros for staff expenses for the magistracy[261]; 403,320,000 euros for staff expenses for administrative and legal

[258] This information was provided in writing by the FPS Justice, General Directorate 'Houses of Justice', 01/12/2014.
[259] This information was provided in writing by the FPS Justice, General Directorate 'Houses of Justice, 12/01/2015.
[260] This information was provided in writing by the FPS Justice, General Directorate, Judicial Order, 29/01/2015.
[261] FEDERAL BUDGET, FPS Justice (56)-00-04.

personnel[262] and 104,937,000 euros for operational expenses[263], making a total budget of 814.826.000 euros. Of the 2,452 magistrates working for the general courts, 20 (0.81%) are linked to the sentencing courts, all working on criminal cases. For this calculation we also use a minimum and maximum estimation. In 2012 the sentencing courts took a decision in 8,256 cases.[264] Table 80 shows the minimum and maximum estimation of the number of cases by type of offence.

Table 80: Decisions made by the sentencing court by type of offence, 2012

Offence	Minimum	Maximum
Illicit drug law violations	420 (5.09%)	2954 (35.79%)
Alcohol law violations	0 (0%)	55 (0,67%)
Tabaco law violations	0 (0%)	0 (0%)
Psychoactive medication law violations	0 (0%)	45 (0.55%)
Property crimes	389 (4.71%)	2917 (35.34%)
Violent crimes	347 (4.20%)	1176 (14.25%)
Sexual crimes	344 (4.17%)	594 (7.20%)

Following the calculations in Table 81 and Table 82, this means a minimum total cost of 717,263 euros and a maximum total cost of 4,156,963 euros.

Table 81: Calculation minimum expenditures sentencing court, 2012

Expenditure category	Total budget (euros)	Fraction sentencing courts	Fraction criminal cases	Fraction specific offence	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	814,826,000	0.81%	100%	5.09%	100%	335,842	46.82%
Alcohol law violations	814,826,000	0.81%	100%	0%	100%	0	0%
Tobacco law violations	814,826,000	0.81%	100%	0%	100%	0	0%
Psych. medication law violations	814,826,000	0.81%	100%	0%	100%	0	0%
Property crime ID	814,826,000	0.81%	100%	4.71%	35.7%	111,046	15.48%
Violent crime ID	814,826,000	0.81%	100%	4.20%	13.1%	36,348	5.07%

[262] FEDERAL BUDGET, FPS Justice (56)-00-01.
[263] FEDERAL BUDGET, FPS Justice (56)-00-02.
[264] These data were provided in writing by the FPS JUSTICE, General Directorate of Correctional Facilities, Department of Management Information, 24/04/2015.

Sexual crime ID	814,826,000	0.81%	100%	4.17%	25.9%	71,243	9.93%
Property crime A	814,826,000	0.81%	100%	4.71%	13.5%	41,992	5.85%
Violent crime A	814,826,000	0.81%	100%	4.20%	24.4%	67,703	9.44%
Sexual crime A	814,826,000	0.81%	100%	4.17%	19.3%	53,089	7.40%
					TOTAL	717,263	100%

ID: illicit drugs; A: alcohol

Table 82: Calculation maximum expenditures sentencing court, 2012

Expenditure category	Total budget (euros)	Fraction sentencing courts	Fraction criminal cases	Fraction specific offence	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	814,826,000	0.81%	100%	35.79%	100%	2,362,087	56.82%
Alcohol law violations	814,826,000	0.81%	100%	0.67%	100%	43,979	1.06%
Tobacco law violations	814,826,000	0.81%	100%	0%	100%	0	0%
Psych. medication law violations	814,826,000	0.81%	100%	0.55%	100%	35,983	0.87%
Property crime ID	814,826,000	0.81%	100%	35.34%	35.5%	832,703	20.03%
Violent crime ID	814,826,000	0.81%	100%	14.25%	13.1%	123,187	2.96%
Sexual crime ID	814,826,000	0.81%	100%	7.20%	15.9%	123,019	2.96%
Property crime A	814,826,000	0.81%	100%	35.34%	13.5%	314,888	7.57%
Violent crime A	814,826,000	0.81%	100%	14.25%	24.4%	229,447	5.52%
Sexual crime A	814,826,000	0.81%	100%	7.20%	19.3%	91,670	2.21%
			TOTAL			4,156,963	100%

ID: illicit drugs; A: alcohol

Alternative sanctions and measures

(Alternatieve gerechtelijke maatregelen/Des mesures judiciaires alternatives)

When an individual has committed a crime, the court can decide on an alternative sanction or measure (ASM) instead of imprisonment or a fine.[265] In general there are four possible alternative sanctions or measures: education, community service, unpaid (community) labour, treatment.

[265] See www.werkstraf.be/nl/maatregelen-de-gemeenschap

These ASM are always situated within mediation in criminal cases, probation or alternatives for custody. In case the alternative sanction or measures is not completed by the sentenced individual, the judge decides on an alternative fine or imprisonment. ASM are framed within social projects carried out by public and non-profit social organizations and institutions. The budget for ASM is provided by three channels:[266] 1) Federal Fund or national projects (nationale projecten/projets nationaux), 2) the Security Fund or Global Plan (globaal plan via het veiligheidsfonds/plan global) and the Road Safety Fund (verkeersveiligheidsfonds/fonds de sécurité routière). Through these funding channels, budgets are made available to subsidize the different projects that are responsible for the organization of the ASM.

a. National Projects[267]

Through this funding channel the minister of Justice grants funding to institutions for the organization of educational measures. In 2012 a total budget of 6,594,000 euros was divided among 9 projects: Slachtoffer in Zicht, Dader in Zicht, Leerproject daders seksueel geweld, Triangle, Interface, Prelude, Time Out, Suggnomé and Médiante. None of these projects were aimed at substance misuse specifically. The first 7 projects on the other hand were aimed at violence, sexual crimes and/or property crimes. Table 83 gives an overview.

Table 83: Overview national projects, 2012

Project	Community	Focus
Interface	French speaking community	Violent crimes
Time Out	Dutch speaking community	Violent crimes
Prelude	French speaking community	Violent crimes
Slachtoffer in Beeld	Dutch speaking community	Violent crimes
Triangle	French speaking community	Sexual crimes
Leerproject daders seksueel geweld	Dutch speaking community	Sexual crimes
Dader in Zicht	Dutch speaking community	Focus on property crimes, but also other crimes are possible
Suggnomé	Dutch speaking community	Mediation between victim and perpetrator, property/violent/sexual crimes
Médiante	French/German speaking community	Mediation between victim and perpetrator, property/violent/sexual crimes

It was not possible to obtain the specific budget for each project separately, thus the total budget was divided by 9 to calculate the substance attributable costs, as can be seen in Table 84. Substance attributable fractions on the sentence execution level are used. This resulted in a total expenditure of 2,646,392 euros (1,376,681 euros attributable to alcohol and 1,269,711 euros attributable to illicit drugs).

[266] This information was provided in writing by the FLEMISH GOVERNMENT, Department of Wellbeing, Public Health and Family, Service of Houses of Justice, on 15/03/2015.
[267] This information was provided in writing by the FLEMISH GOVERNMENT, Department of Wellbeing, Public Health and Family, Service of Houses of Justice on 15/03/2015.

Table 84: Overview calculations national projects – non-consensual crimes, 2012

project	Total budget (euros)	attributable fraction alcohol	Attributable fraction illicit drugs	Expenditure alcohol (euros)	Expenditure illicit drugs (euros)
VIOLENT CRIMES					
Interface	732,666. 7	24.4%	13.1%	178,771	95,979
Time Out	732,666. 7	24.4%	13.1%	178,771	95,979
Prelude	732,666. 7	24.4%	13.1%	178,771	95,979
Slachtoffer in beeld	732,666. 7	24.4%	13.1%	178,771	95,979
			Subtotal violent crimes	715,083	383,917
SEXUAL CRIMES					
Triangle	732,666. 7	19.3%	25.9%	141,405	189,761
Leerproject daders seksueel geweld	732,666. 7	19.3%	25.9%	141,405	189,761
			Subtotal sexual crimes	282,809	379,521
PROPERTY CRIMES					
Dader in zicht	732,666. 7	13.5%	19.3%	98,910	141,405
			Subtotal property crimes	98,910	141,405
PROPERTY/VIOLENT/SEXUAL CRIMES					
Suggnomé	732,666. 7	19.1%	24.9%	139,939	182,434
Médiante	732,666. 7	19.1%	24.9%	139,939	182,434
			Subtotal Property/violent/sexual crimes[268]	279,879	364,868
			TOTAL	1,376,681	1,269,711

b. Global Plan[269]

The Global Plan allows local authorities to engage extra personnel in light of the ASM. The local authorities sign a yearly agreement with the minister of justice in order to receive a fixed financial contribution to this end. The projects are responsible for the organization and coordination of educational measures, community service measures, community labour measures and treatment measures. The new personnel is employed within the own social services of the local authorities or dispatched to other social organizations with activities related to ASM. In 2012 a budget of 6,236,381.40 euros was made available through the Global Plan. This means the employment 184.25 fulltime employees, divided between 82 local authorities. Table 85 gives an overview of all 2012 projects linked to substance misuse. There were no projects focusing on tobacco, psychoactive medication or alcohol separately.[270]

[268] In order to calculate these attributable fractions we used the mean of the substance attributable fractions for violent crimes, property crimes and sexual crimes.

[269] This information was provided in writing by the FLEMISH GOVERNMENT, Department of Wellbeing, Public Health and Family, Service of Houses of Justice, of the Flemish Government on 15/03/2015.

[270] The project 'Rijden onder invloed' carried out by Group Intro is aimed at driving under the influence of alcohol and was attributed a budget of 16.113,08 euros in 2012. This cost will be included in the overview on traffic related expenditures.

Table 85: Overview expenditures AGM projects -Global Fund – Substance abuse, 2012

Organization	Local Authority	Budget 2012 (euros)
ILLICIT DRUGS		
De Sleutel VZW	Brugge	71,889.12
	Gent	55,776.04
	Mechelen	32,266.16
	Veurne	19,831.12
Vzw Katarsis	Hasselt	71,889.12
Centra voor alcohol -en andere drugsproblemen	Hasselt	64,452.32
Ambulante Drugzorg	Ieper	39,662.96
Kompas, vzw	Kortrijk	3,662.96
Vzw De Kiem	Gent	158,651.84
Alter Ego	Châtelet	79,325.92
Asbl Phénix	Namen	48,339.24
Service LEPA	Verviers	208,230.56
	Subtotal illicit drugs	**889,977.36**
	ILLICIT DRUGS & ALCOHOL	
GAM-Dienst leerstraffen *	Leuven	168,567.60
CGG Zuid-Oost Vlaanderen *	Geraardsbergen Zotegem	99,157.40
CGG De Meander *	Turnhout	91,720.60
CAW Piramide *	Kortrijk	64,452.32
	Subtotal Illicit drugs and alcohol	**423,897.92**
	TOTAL	**1,313,875.28**

The projects marked with an '*' are projects that are also linked to other offences than substance misuse and substance law violations. The mentioned budget is the budget for the whole project and is thus an overestimation of the budget linked to substance misuse. However, these projects are excluded from Table 86 which gives an overview of all 2012 projects linked to non-consensual crime. The total in this table is thus an underestimation of the budget linked to non-consensual crimes.

To calculate the expenditures linked to non-consensual crimes, attributable fractions on the sentence execution level are used. This resulted on a total expenditure of **173,700 euros** (of which 102,629 euros that are alcohol attributable and 71,071 euros that are illicit drugs attributable).

Table 86: Overview AGM projects - Global Fund - Non-consensual crimes, 2012

Organization	Local Authority	Focus	Budget 2012 (euros)	Substance Attributable fraction Alcohol/illicit drugs		Expenditure 2012 Alcohol (euros)	Expenditure 2012 Illicit drugs (euros)
Groep Intro	Brugge	Violent crime	32,226.16	24.4%	13.1%	7,863	4,222
	Oostende		16,113.08			3,932	2,111
Dienst leerstraffen Dilbeek	Dilbeek	Violent crime	32,226.16	24.4%	13.1%	7,863	4,222

VGGZ	Hasselt	Violent crime	39,662.96	24.4%	13.1%	9,678	5,196
CGG De Pont	Mechelen	Violent crime	64,452.32	24.4%	13.1%	15,726	8,443
Dienst Welzijn	Lier	Violent crime	16,113.08	24.4%	13.1%	3,932	2,111
CGG De Spiegel	Oudenaarde	Violent crime	59,494.44	24.4%	13.1%	14,517	7,794
CAW De Kempen	Mol	Violent crime	32,266.16	24.4%	13.1%	7,873	4,227
CAW De Kempen	Turnhout	Violent crime	32,226.16	24.4%	13.1%	7,863	4,222
SUBTOTAL		**VIOLENT CRIME**	**324,780.52**			**79,246**	**42,546**
CGG De Drie Stromen	Dendermonde	Sexual/violent crimes	19,831.48	21.9%	19.5%	4,343	3,867
CGG Waas end Dender	Dendermonde	Property/violent crimes	19,831.48	18.9%	24.4%	3,748	4,839
AGM Maasmechelen	Maasmechelen	Property/violent/sexual crimes	32,226.16	19.1%	24.9%	6,155	8,024
Veiligheidshuis Genk	Genk	Property/violent crimes	48,339.24	18.9%	24.4%	9,136	11,795
SUBTOTAL		**PROPERTY/VIOLENT/SEXUAL CRIMES**[271]	**120,228.36**			**23,383**	**28,525**
TOTAL		**NON CONSENSUAL CRIMES**	**445,008.88**			**102,629**	**71,071**

c. Road Safety Fund [272]

The Road Safety Fund is used to fund projects that aim at improving road safety. More specifically this implies the 'Driver Improvement' project of the Belgian Road Safety Institute (BRSI) and the PROVELO project (community labour). These expenditures are excluded here and reported in the overview on traffic related expenditures.

Summary

To summarize, Table 87 gives an overview of all substance attributable expenditures at the sentence execution level. These costs are mainly related to illicit drugs use (79.50-75.21%) and alcohol (20.17%-24.16%).

[271] In order to calculate these attributable fractions we used the mean of the substance attributable fractions for each crime mentioned.

[272] This information was provided in writing by the department of Wellbeing, Public Health and Family, Service of Houses of Justice, of the Flemish Government on 15/03/2015.

Table 87: Overview substance attributable expenditures on the sentence execution level by type of substance, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Other (ID and alcohol)	Total
Correctional facilities	73,875,428 - 220,698,588	15,148,588 - 69,587,083	0 - 0	0 - 1,652,754	0 - 0	89,024,016- 291,938,425
Community institutions	14,261,574	5,024,605	0	0	0	19,286,180
French Specific Projects	1,059,741	172,349	0	0	0	1,232,090
Houses of Justice	8,425,917	3,414,808	0	0	0	11,840,725
Electronic surveillance	1,122,499	351,749	0	0	0	1,474,249
Sentencing court	554,480- 3,440,996	162,783- 679,984	0 0	0, 35,983	0, 0	717,263, 4,156,963
ASM	2,230,760	1,479,310	0	0	423,898	4,133,968
Total	101,530,399- 251,240,075	25,754,193- 80,709,889	0- 0	0- 1,688,737	423,898- 423,898	127,708,490- 334,062,599
Proportion	79.50%- 75.21%	20.17%- 24.16%	0.00%- 0.00%	0.00%- 0.51%	0.33%- 0.13%	100.00%- 100.00%

2.1.5. Coordination

Department of Criminal Policy *(Dienst voor het strafrechtelijk beleid/Service de la politique criminelle)*

The department of criminal policy provides policy support and coordinate for the minister of justice, who is politically responsible for the criminal policy in Belgium. This department had a budget of 2,460,000 euros[273] in 2012 of which **45,196 euros** were employed for illicit drug specific activities.[274] [275]

Summary

Table 88 gives an overview of all substance attributable expenditures on coordination.

Table 88: Overview substance attributable expenditures on coordination, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total
Criminal Policy	45,196	0	0	0	45,196
Total	**45,196**	**0**	**0**	**0**	**45,196**
Proportion	100.00%	0.00%	0.00%	0.00%	100.00%

[273] FEDERAL BUDGET, FPS Justice, (63).

[274] See for an overview of these activities: http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=64&Itemid=74

[275] This information was provided in writing by the FPS JUSTICE, Department of Criminal Policy on 24/02/2015.

2.1.6. Research

Research Crime

In 2012 the Belgian Federal Science Policy funded a number of projects including some focusing on illicit substance misuse and crime. More specifically **52,971 euros** were spent on three projects[276]:

Table 89: Research projects focusing on illicit drugs, 2012

YILCAN	Yield of Illicit Indoor Cannabis Plantations
GEOCAN	Study of the market share of Belgian cultivated cannabis in the Belgian cannabis market.
CANMARKT	Cannabis production in Belgium: assessment of the nature and harms, and implications for priority setting

Overview

Table 90 gives an overview of all substance attributable expenditures on research.

Table 90: Overview substance attributable expenditures on research, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total
Research projects	52,971	0	0	0	52,971
Total	52,971	0	0	0	**52,971**
Proportion	100.00%	0.00%	0.00%	0.00%	100.00%

B. Direct costs as a consequence of crime

Property loss *(private cost)*

Crime and especially property crimes can lead to the involuntary transfer of property. Since we consider this kind of transfer as harmful to society, regardless of gains of possible purchasers, costs of property loss are included in this study (Czabanski, 2008; McCollister, French, & Fang, 2010). The value of these losses are estimated based on Belgian insurance data for the year 2012, as reported by the National Bank. [277] Table 91 shows the financial compensations made by insurance companies (to individuals and other private actors) in the year 2012 for theft. The compensations are used as a proxy for the value of the lost or damaged goods, as a cause of theft suffered by private actors. Because these costs can only be partially attributed to substance misuse, these numbers are multiplied with the correct attributable fractions. The attributable fractions on the investigation level are used.[278] This results in an estimated cost of 31,867,951 euros attributable to illicit drugs and 29,465,844 euros attributable to alcohol. Contrary to the direct costs calculated so far, these costs can be seen as public expenditures but are private costs carried by individuals and other private actors (e.g. families, companies etc.).

[276] BELSPO, Fedra, http://www.belspo.be/belspo/fedra/prog.asp?l=nl&COD=DR

[277] NATIONAL BANK, Financial Supervision, Insurance institutions, non-life, http://www.nbb.be/pub/cp/domains/vo/sta.htm?l=nl

[278] A similar calculation could be made for the lost are damaged goods by fire caused by burning cigarettes. However, since we do not know the percentage of fires caused by burning cigarettes, it is not possible to give this calculation in our study.

Table 91: Overview calculation costs of property loss and damage due to theft, 2012 (euros)

	Insurance		Compensation	Illicit drugs attributable (19.9%)	Alcohol attributable (18,4%)
Theft	Residential home		95353,205	18,975,288	17,544,990
	Company		10,391,585	2,067,925	1,912,052
	Vehicle	Car	42,695,109	8,496,327	7,855,900
		Cycle	565,674	112,569	104,084
		Bus	66,071	13,148	12,157
		Taxi	51,168	10,182	9,415
		<3,5t	3,327,856	662,243	612,326
		>3,5t	2,535,444	504,553	466,522
	Agricultural risk		408,134	81,219	75,097
	Other		1.590,225	316,455	292,601
	Non-technical		3.155,988	628,042	580,702
	TOTAL		160,140,459	31,867,951	29,465,844

Because insurances for theft and property loss are not mandatory in Belgium, the cost should probably be estimated higher. Furthermore, these numbers do not include the insurance benefit not recovered in case of insurance compensation. This means the estimated cost is an underestimation of the total cost of property loss and damage.

C. Direct costs in anticipation of crime

Strategic safety and prevention plan (SVPP)
(strategische veiligheids- en preventie plan/plan stratégique de sécurité et de prévention)

An SVPP is an instrument that allows communities to implement and execute a nuisance and crime prevention policy. After a local security assessment, the strong points and weaknesses regarding safety and prevention are analysed. Consequently, the SVPP is based on this analysis and aims to address the discovered issues. For the execution of the SVPP an agreement is signed between the minister of interior and the community in question. This agreement details general, strategic and operational goals, aimed at reaching results at the end of the duration of the agreement.

The SPF Interior grants financial allowances to communities in order to implement such a security and prevention plan. This allowance is granted to cover the costs that arise from the execution of the agreement such as staff expenses, operational expenses and investments. Part of the security and prevention plan can be to tackle illicit drugs related social nuisance. In 2012, 101 communities asked for funding regarding this part of the SVPP, for a total amount of 6,141,196 euros, of which 3,566,185 euros were granted.[279]

[279] This information was provided in writing by the FPS INTERIOR, General Directorate Safety and Prevention, on 19/03/2015.

2.2. INDIRECT COSTS

A. Indirect costs as a consequence of crime

2.2.1. Productivity losses due to incarceration

Productivity losses can be conceptualized as the goods and services not produced, in this case due to the consequences of substance related crimes. More specifically we will calculate the costs linked to lost productivity because of incarceration, using the following calculation; .

*# incarcerations in 2012 * average duration of detention * % economical active inmates prior to detention *daily labour cost * substance attributable fraction*

The same method to calculate the average duration of detention will be used as for the cost calculations of the penitentiary institutions. Again, in order to avoid overlap when calculating the costs we use a minimum and maximum estimation of the total costs. Table 92 shows the average duration of detention for each offence.

Table 92: Calculation of average duration of detention, 2012

	Min Drug law violation	Max Drug law violation	Min alcohol law violation	Max alcohol law violation	Min Tobacco law violation	Max tobacco law violation	Min med law violation	Max. med. Law violation	Min violent crime	Max violent crime	Min property crime	Max Property crime	Min sexual crime	Max sexual crime
Population March 1st	1062	2354	0	37	0	0	0	33	498	2467	597	4108	520	1015
Incarcerations 2012	2549	4247	5	24	0	6	0	15	984	2795	3019	8262	445	780
Average duration detention	152.49	202.86	0.00	564.25	0	0.00	0	805.20	185.23	323.05	72.38	181.98	427.69	476.27

Next we have to determine the proportion of inmates that had a job before detention and thus suffer productivity loss due to incarceration. Since there are no Belgian data available on the socio-economic characteristics of detainees prior to their detention,[280] we use data provided by the Dutch Service of Judicial Institutions. It is estimated that of all inmates who were released from Dutch prisons in 2010, 71 % had some kind of legal income prior to detention.[281] Of this group, 38,1 % obtained this income through labour or as a business owner.[282] This means only 27,1 % off all inmates leaving prison in the Netherlands

[280] This information was provided in writing by the FPS JUSTICE, General Directorate of Penitentiary Institutions, Department of Management Information on 10/04/2015.

[281] WODC, Noordhuizen & Weijters (2012). Cahier 2012-2013, Third measurement of the monitor aftercare for ex-detainees: http://www.wodc.nl/onderzoeksdatabase/monitor-nazorg-2010-3e-meting.aspx

[282] Next to income form labour or business ownership, the available data further specify the type of income by type of social security payment. However, since the social security system and the types of social security payments in the Netherlands differ from the system in Belgium we limit the calculation to productivity losses from income coming from the labour market. Furthermore, it is debatable whether income from social welfare payments/unemployment benefits can be seen as a productivity loss, since it is in fact a transfer costs.

was economically active prior to detention in 2010.[283] The Netherlands have traditionally a higher mean employment rate, for the general population, compared to Belgium. We expect this situation to reflect in the prison population. Therefore the Dutch proportion of inmates economically active prior to detention will be adjusted, based on the ratio between the Belgian employment rate and the Dutch employment rate. In 2012, the Belgian government reported a mean employment rate of 61.8%[284], compared to a mean employment rate of 67.2% reported by the Dutch government[285]. This means an estimated 24.9% of all Belgian inmates in 2012, had a legal job prior to detention.[286]

We make the assumption that the average labour cost in the general population can be compared to the average labour costs of the economically active prison population. The SPF Economy reports a mean annual labour costs of 49,156 euros in 2012.[287] Divided by 366 this means a mean daily labour cost of 134.306 euros. Table 93 and Table 94 give an overview of the calculations. The substance attributable fractions on the sentence execution level are used. This results in a minimum estimation of productivity loss due to incarceration of 21,756,494 euros and a maximum estimation of productivity loss of 71,346,553 euros.

Table 93: Calculation of productivity losses due to incarceration - minimum estimation, 2012

Expenditure category	# incarcerations	Average duration detention	% economical active	Average (daily) labour cost (euros)	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	2,549	152.49	0.249	134.306	1	12,998,714	59.75%
Alcohol law violations	5	0.00	0.249	134.306	1	0	0.00%
Tobacco law violations	0	0.00	0.249	134.306	1	0	0.00%
Psych. medication law violations	0	0.00	0.249	134.306	1	0	0.00%
Property crime ID	3,019	72.38	0.249	134.306	0.357	2,608,666	11.99%
Violent crime ID	984	185.23	0.249	134.306	0.131	798,503	3.67%
Sexual crime ID	445	427.69	0.249	134.306	0.259	1,648,462	7.58%
Property crime A	3,019	72.38	0.249	134.306	0.135	986,470	4.53%
Violent crime A	984	185.23	0.249	134.306	0.244	1,487,288	6.84%
Sexual crime A	445	427.69	0.249	134.306	0.193	1,228,391	5.65%
					TOTAL	23,678,755	100%

[283] WODC, Dutch Ministry of Security and Justice, Annual report on the aftercare of ex-detainees: https://www.wodc.nl/onderzoeksdatabase/monitor-nazorg-2010-3e-meting.aspx

[284] This information was derived from the Federal Public Service Economy website on 12/05/2015 http://economie.fgov.be/nl/modules/publications/statistiques/arbeidsmarkt_levensomstandigheden/belgische_arbeidsmarkt_1983-2014.jsp The employment rate of 61.8% is probably an overestimation of the reality because no correction is applied accounting for a higher proportion of unemployment among substance users.

[285] DUTCH GOVERNMENT, Centraal Bureau voor Statistiek, The Dutch Economy 2012, http://www.cbs.nl/NR/rdonlyres/04BF9AB4-CBDE-47F0-8447-7B6F6BB69675/0/2012p19pub.pdf

[286] 27.1% * (61.8%/67.2%)

[287] FPS ECONOMICS, http://statbel.fgov.be/nl/statistieken/cijfers/arbeid_leven/lonen/activiteit/. This is most likely an overestimation of the average wage of detainees since it was not possible to control for influencing factors such as educational level, sector etc.

Table 94: Calculation of productivity losses due to incarceration- maximum estimation, 2012

Expenditure category	# incarcerations	Average duration detention	% economical active	Average (daily) labour cost (euros)	Substance attributable fraction	Total cost (euros)	Proportion
Illicit drug law violations	4,247	202,86	0.249	134.306	1	28,812,593	40.38%
Alcohol law violations	24	564,25	0.249	134.306	1	452,874	0.63%
Tobacco law violations	6	0,00	0.249	134.306	1	0	0.00%
Psych. medication law violations	15	805,20	0.249	134.306	1	403,915	0.57%
Property crime ID	8,262	181,98	0.249	134.306	0.357	17,950,417	25.16%
Violent crime ID	2,795	323,05	0.249	134.306	0.131	3,955,636	5.54%
Sexual crime ID	780	476,27	0.249	134.306	0.259	3,217,671	4.51%
Property crime A	8,262	181,98	0.249	134.306	0.135	6,787,973	9.51%
Violent crime A	2,795	323,05	0.249	134.306	0.244	7,367,750	10.33%
Sexual crime A	780	476,27	0.249	134.306	0.193	2,397,724	3.36%
					TOTAL	71,346,553	100%

Some remarks are in place:

- In general, individuals lose the right to social security payments the moment they are detained. However, there are some exceptions[288], resulting in a small number of detainees who maintain their income from social security payments while detained. Since this information is not recorded by the SPF Justice, the General Directorate EPI, nor the individual social security payment institutions, it was not possible to give an estimate of the number of those inmates.[289]
- The remitting of these social security payments does not generate an extra costs for the SPF Justice, since the original social security payment institutions remain responsible for the correct

[288] The right to unemployment benefits (werkloosheidsuitkering), social welfare (leeflloon) and supplementary benefits for disabled persons (inkomensvervangende uitkering voor personen met een handicap) is cancelled when incarcerated. On the other hand, detainees do maintain their right to benefits for occupational accidents (uitkering arbeidsongevallen) and occupational diseases (beroepsziekten). Pensions are only paid the first 12 months. Disability benefits (invaliditeitsuitkering) are maintained for detainees with dependent family members and cut in half for single households. See Limberghen and van der Plancke . http://health.belgium.be/internet2Prd/groups/public/@public/@mixednews/documents/ie2divers/19101580_nl.pdf

[289] This information was provided in writing by the FPS JUSTICE, General Directorate EPI on 08/05/2015; the FMP/FBZ on 16/06/2015; the RIZIV/INAMI on 17/06/2015; the PDOS/SdPSP on 24/06/2015 and the FAO/FAT on 06/07/2015. The RIZIV/INAMI did repot a total of 1044 inmates in single households that received 50% of their disability benefits. There were no data for detainees with family members, since their continued payment does not require additional registration. Recently the Federal Minister of Social Affairs and Public Health, announced that the disability benefits and benefits for occupational diseases for detainees will be cancelled. This would affect approximately 1600 detainees. For more information see the rapport of the federal commission on social affairs of 27/05/2015: http://www.dekamer.be/kvvcr/showpage.cfm?section=/cricra&language=nl&cfm=dcricra.cfm?type=comm&cricra=cri&count=all&legislat=53

payment.[290] In case disability or occupational disease are caused by substance misuse, the calculation of these costs is incorporated in the chapter Health.

- Next to productivity loss, detainees who work in prison also generate a small productivity gain.[291]
- All incarcerated individuals are considered old enough to be in the workforce.[292] It is possible that some inmates where still going to school at the time of their detention. However, we make the assumption that this is not the case since all inmates are in principle minimum 18 years old and thus no longer fall under the compulsory education requirement.
- It is possible to make a similar calculation for the productivity losses because of lost school days for minors in juvenile institutions, based on the average value of a lost school day (Miller et al., 2006). However, because of the compulsory education requirement, youth are obliged by law to follow an education until they are 18 years old. This means their education is continued within the juvenile institution. Hence we make the assumption that there are no productivity losses for lost school days for minors in juvenile institutions.

2.2.2. Productivity losses due to premature mortality

Victims of crime may die prematurely as a consequence of that crime. This means a loss of productivity for the lost remaining productive life years (until the age of 65). The associated productivity loss can be calculated using the following formula. Since it can be expected that premature mortality can occur throughout the year (and not only at the beginning of that year) we adjust the formula by only taking half the first year into account.

*Substance attributable fraction * # productive life years lost * annual labour cost * mean employment rate*

Based on the number of reported deaths by homicide as reported by the SPF Economics and the number of productive life years lost for every case (106), a total loss of 2774 healthy, productive life years could be calculated caused by homicide for Belgium in 2012.[293] The SPF Economy further reports an average yearly labour cost of 49,156 euros 2012 and a population economically active rate of 61.8%.[294] Inserting these numbers in the formula and using the substance attributable fractions for violent crime on the investigation level this means a productivity loss due to premature mortality caused by homicide of

[290] The FPS Justice does not become responsible for the payment of those social security payments and does not keep any record of which detainees receive which social payment. However, until recently the FPS Justice did foresee a yearly average of 3,000,000 euro for detainees under electronic surveillance who had no other means of income. This budget is already incorporated into the calculation of the expenditures for electronic surveillance.

[291] On average 1700 detainees produce for private companies and gain between 2.1 and 3.00 euros for each finished piece. 400 detainees work in the own workshops of the RGA (bakery, cheese making, wood shop etc.) and gain between 1.5 and 2.7 euros an hour. Around 2000 detainees perform household chores in prison (cleaning, gardening, kitchen etc.) and make 0.95 euros an hour. Finally around 400 detainees follow a vocational training and receive 0.62 euros an hour. The activities carried out for private companies and in the workshops of the RGA generate an average yearly profit of 2,500,000 euros for the RGA (and thus not for the individual prisons). This profit is used to fund vocational training, projects and activities. The remaining profit flows 100% back to the federal government. This information was provided in writing by the DG EPI, RGA on 06/05/2015 and 28/07/2015.

[292] Minors tried as an adult are accommodated in the federal youth institution of Tongeren in 2012.

[293] FPS ECONOMICS, Statistics Belgium, http://statbel.fgov.be/. These specific numbers have not yet been published online.

[294] FPS ECONOMICS, http://statbel.fgov.be/nl/statistieken/cijfers/arbeid_leven/lonen/activiteit/.

33,477,158 euros of which 6,034,154 (18,02%) are illicit drugs attributable and 27,443,003 (81,98%) are alcohol attributable. This can be seen in Table 95. This cost is an underestimation since data for other crimes than homicide were not available.

Table 95: Productivity losses due to premature mortality, for the reference year 2012 and for future years (euros)

Substance	2012 (1/2 year)	costs future years (until the age of 65)	Total
Illicit drugs	117,534	5,916,620	6,034,154
Alcohol	534,538	26,908,465	27,443,003
Total	652,073	32,825,085	33,477,158

Summary

Table 96 gives an overview of all substance related expenditures caused by productivity losses. The costs are almost evenly divided between illicit drugs (43.61%-57.21%) and alcohol (56.39%-42.40%).

Table 96: Overview substance related productivity losses, total (2012 and future costs) (euros)

Productivity loss	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total (euros)
Incarceration	18,054,345-53,936,317	3,702,149-17,006,321	0	0-403,915	21,756,494-71,346,553
Premature mortality	3,546,420	25,372,274	0	0	33,477,158
Total	24,088,499-59,970,471	31,145,152-44,449,324	0	0-403,915	55,233,652-104,823,710
Proportion	43.61% - 57.21%	56.39% - 42.40%	0.00% - 0.00%	0.00% - 0.39%	100.00% - 100.00%

B. Indirect costs in anticipation of crime

Anticipation to theft *(private cost)*

Individuals and other private actors spend time and money anticipating crime and taking precautions. One example of such precautions is to ensure oneself against theft. The total amount of insurance payments made by individuals and companies to cover any losses in case of theft can be used as a proxy for the cost society is willing to pay to prevent theft. These costs are not public expenditures, carried by the government, but private costs.

Table 97 gives an overview of the total value of insurance fees paid by individuals and companies in anticipation of theft in 2012.[295] Because these costs can only be partially attributed to substance misuse, these numbers are multiplied with the attributable fractions that are used on the investigation level.[296]

[295] NATIONAL BANK, Financial Supervision, Insurance institutions, non-life, http://www.nbb.be/pub/cp/domains/vo/sta.htm?l=nl

[296] A similar calculation could be made to estimate the costs in anticipation of fire caused by burning cigarettes. However, since we do not know the percentage of fires caused by burning cigarettes, it is not possible to give this calculation in our study.

This results in a total expenditure in anticipation of crime (theft) of 546,571,245 euros of which 108,767,678 euros (51.96%) are illicit drugs attributable and 100,569,109 euros (48.04%) are alcohol attributable.

Table 97: Calculation costs of anticipation to theft, 2012 (euros)

	Insurance		Insurance Fees	Illicit drugs attributable (19,9%)	Alcohol Attributable (18,4%)
Theft	Residential home		195,218,515	38,848,484	35,920,207
	Company		26,128,342	5,199,540	4,807,615
	Vehicle	Car	273,564,012	54,439,238	50,335,778
		Cycle	2,496,968	496,897	459,442
		Bus	765,133	152,261	140,784
		Taxi	516,158	102,715	94,973
		<3,5t	22,218,501	4,421,482	4,088,204
		>3,5t	9,252,064	1,841,161	1,702,380
	Agricultural risk		805,803	160,355	148,268
	Other		5,632,470	1,120,862	1,036,374
	Non-technical		9,973,279	1,984,683	1,835,083
	TOTAL		546,571,245	108,767,678	100,569,109

Tax returns for fire and burglary prevention

The Belgian Federal Government allows a yearly tax reduction for certain preventive measures against fire and burglary on (family) homes.[297] The maximum cost that can be declared is set at 750 euros per year per building.[298] In 2012 the federal government reported a total expense of 34,320,000 euros concerning these tax reductions.[299] Applying the attributable fractions for property crimes at the investigation level, this means a total cost of 13,144,560 euros, of which 6,314,880 euros (48.04%) are alcohol attributable and 6,829,680 euros (51.96%) are illicit drugs attributable. This is shown in Table 98. Two things have to be kept in mind: 1) on the one hand, this calculation only includes tax returns granted by the federal government, not by the regions or local communities, and as such is an underestimation; 2) on the other hand, these cost include both expenses for burglary prevention and for fire prevention and as such are an overestimation since the expenses for fire could not be extracted.

Table 98: Calculation tax returns for fire and burglary prevention, 2012

Expenditure category	Total budget (euros)	Substance Attributable fraction	Cost (euros)	Proportion
Illicit drugs	34,320,000	19.9%	6,829,680	51.96%
Alcohol	34,320,000	18.4%	6,314,880	48.08%
		TOTAL	13,144,560	100.00%

[297] These costs are listed under indirect costs, because we see the granted tax returns as causing a reduced (fiscal) income, rather than a direct expense.

[298] FPS Finances, Tax Returns, http://financien.belgium.be/nl/particulieren/belastingvoordelen/inbraak-_en_brandbeveiliging/

[299] FPS Finances, Statistics and Analysis, http://financien.belgium.be/nl/Statistieken_en_analysen/cijfers/inventaris_van_de_federale_fiscale_uitgaven/

Overview

Table 99 provides an overview of the indirect expenditures made in anticipation of crime by type of substance. These expenditures are equally divided by illicit drugs and alcohol.

Table 99*:* Overview indirect expenditures in anticipation of crime, by type of substance, 2012 (euros)

Institution	Illicit drugs	Alcohol	Tobacco	Psychoactive medication	Total
Private	108767678	100569109	0	0	209336787
Tax returns	6829680	6314880	0	0	13144560
Total	115597358	106883989	0	0	222481347
Proportion	51,96%	48,04%	0,00%	0,00%	100.00%

2.3. INTANGIBLE COSTS

Crime can have important consequence in terms of pain, suffering and lost quality of life. Because these costs have no market price it is difficult to translate them into monetary values. Still they represent a large portion of the social costs linked to the victims of crime (Cohen, 2005).

In order to estimate intangible costs linked to substance attributable crime we use the method of Disability Adjusted Life Years (DALY). The World Health Organization estimates that in 2012, 10,900 DALY's were lost due to interpersonal violence in Belgium.[300] If we multiply this by the agreed value of 1 DALY, 40,000 euros (Desaigues et al., 2007), we obtain a loss of 436,000,000 euros on pain and suffering caused by interpersonal violence in Belgium, 2012. Multiplied by the substance attributable fractions on the investigation level (for violent crimes) this means a total expenditure of **176,580,000 euros,** of which 144,752,000 euros are alcohol attributable and 31,828,000 are illicit drugs attributable (Table 100).

Table 100: Substance attributable intangibles costs on violent crime , 2012 (euros)

Intangible cost of interpersonal violence	Alcohol attributable (33.2%)	Illicit drugs attributable (7.2%)
436,000,000	144,752,000	31,828,000

This calculation only takes intangible costs caused by physical consequences of violent crime into account. This means this number is an underestimation of the intangible costs associated with substance abuse related crime since a number of elements are not taken into account (see also Czabanski, 2008).

- Cost of non-violent crimes and substance related crimes;
- Cost of psychological consequences;
- Cost of the impact of 'being a victim', regardless of physical or psychological harm.

[300] WHO, 2012, http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html

3. OVERVIEW OF CRIME COSTS

Table 101: Substance attributable costs of crime 2012

	DIRECT COSTS						
	ILLEGAL DRUGS	ALCOHOL	TOBACCO	PSYCHOACTIVE MEDICATION	OTHER (ID AND PM)	OTHER (ALC AND ID)	TOTAL
PUBLIC EXPENDITURES							
INVESTIGATION	106,262,348	95,904,815	13,259,539	11,454,284	0	0	226,880,986
PROSECUTION	43,658,074	39,971,177	362,408	24,161	0	0	84,015,820
SENTENCING	10,809,084	5,644,973	18,594	1,253,683	241,723	0	17,968,058
SENTENCE EXECUTION							
minimum	101,530,399	25,754,193	0	0	0	423,898	127,708,490
maximum	251,240,075	80,709,889	0	1,688,737		423,898	334,062,599
COORDINATION	45,196	0	0	0	0	0	45,196
RESEARCH	52,971	0	0	0	0	0	52,971
FIRE DEPARTMENT	0	0	0	0	0	0	0
PREVENTION	3,566,185	0	0	0	0	0	3,566,185
PRIVATE COSTS							
PROPERTY LOSS	31,867,951	29,867,951	0	0	0	0	61,333,795
TOTAL DIRECT COSTS							
minimum	**297,792,208**	**197,143,110**	**13,640,541**	**12,732,128**	**241,723**	**423,898**	**521,571,501**
maximum	**447,501,885**	**252,098,807**	**13,640,541**	**14420,864**	**241,723**	**423,898**	**727,925,611**
PROPORTION							
minimum	**57.10%**	**37.80%**	**2.62%**	**2.44%**	**0.05%**	**0.08%**	**100.00%**
maximum	**61.48%**	**34.63%**	**1.87%**	**1.98%**	**0.03%**	**0.06%**	**100.00%**

INDIRECT COSTS							
	Illegal drugs	Alcohol	Tobacco	Psychoactive medication	Other (ID and PM)	Other (ALC and ID)	Total
PRODUCTIVITY LOSS INCARCERATION							
minimum	18,054,345	3,702,149	0	0	0	0	21,756,494
maximum	53,936,317	17,006,321	0	403,915	0	0	71,346,553
PRODUCTIVITY LOSS PREMATURE MORTALITY (Homicide)							
YEAR 2012	117,534	534,538	0	0	0	0	652,073
FUTURE YEARS	5,916,620	26,908,465	0	0	0	0	32,825,085
PRIVATE ANTICIPATION							
THEFT	108,767,678	100,569,109	0	0	0	0	209,336,787
TAX RETURNS THEFT	6,829,680	6.314.880	0	0	0	0	13,144,560
TOTAL INDIRECT COSTS							
minimum	**139,685,857**	**138,029,141**	**0**	**0**	**0**	**0**	**277,714,999**
maximum	**175,567,829**	**151,333,313**	**0**	**403,915**	**0**	**0**	**327,305,057**
Proportion							
minimum	**50.30%**	**49.70%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100.00%**
maximum	**53.64%**	**46.24%**	**0.00%**	**0.13%**	**0.00%**	**0.00%**	**100.00%**

INTANGIBLES							
	Illegal drugs	Alcohol	Tobacco	Psychoactive medication	Other (ID and PM)	Other (ALC and ID)	Total
INTERPERSONAL VIOLENCE	31,828,000	144,752,000	0	0	0	0	176,580,000
Proportion	**18.02%**	**81.98%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**100.00%**

TRAFFIC

1. METHODS

1.1. Introduction

Below, an overview is provided on the methods used to estimate the substance-attributable direct, indirect and intangible costs related to 'traffic'. In Table 102, an overview is provided of the different cost components pertaining to the three major cost categories 'direct costs', 'indirect costs', and 'intangible costs' that were included in the SOCOST research project.

Table 102: Cost categories related to 'Traffic' included in the SOCOST research project

Main cost category	cost items
DIRECT COSTS	
A. Health related costs	
Inpatient care	Hospitalisation
Prevention	Belgian Road Safety Institute
Research	Road Safety Knowledge Centre
B. Crime related costs	
Investigation	Federal and local police
Sentencing	General Courts
	Legal aid
	Legal Expenses
Sentence Execution	Penitentiary Institutions
	Sentencing court
	Re-instatement assessments
	Alternative sanctions and measures
INDIRECT COSTS	
Productivity loss	As a consequence of premature mortality
	As a consequence of incarceration
INTANGIBLE COSTS	
Disability-adjusted life years (DALYs)	Road injuries

1.2. Substance attributable fractions

The substance-attributable fractions (SAFs) are used to determine the proportion of the total traffic accidents caused by substance (mis)use. To calculate these fractions Belgian data are used from two DRUID studies[301]. A first study (Isalberti, Van der Linden, Legrand, Verstraete, Bernhoft et al., 2011) reports the prevalence of alcohol and other psychoactive substances in drivers who have been injured in traffic accidents (patients hospitalised, injury severity MAIS 2 or higher, between 2008 and 2010). These SAFs are used to calculate the inpatient hospital costs, the productivity losses due to premature mortality[302] and the intangibles. A second study (Houwing, Hagenzieker, Mathijssen, Bernhoft, Hels, Janstrup et al., 2011) presents the prevalence of illicit drugs, alcohol and psychoactive medicinal drugs by drivers in general traffic (randomly selected drivers between 2007 and 2009).[303] These prevalence rates are used for the cost calculation of hospital day care. These costs of hospital day care might be underestimated since we use the prevalence rates for drivers in general traffic instead of slightly injured drivers. Table 103 presents the substance group distribution of injured drivers and Table 104 for drivers in general traffic.

Table 103: Prevalence of substances in injured drivers, 2008-2010

Substance	Prevalence (%)
None	63.0
Alcohol	20.3
Illicit drugs only	4.9
Psychoactive medication only[304]	5.5
Alcohol and illicit drugs	2.8
Alcohol and psychoactive medication	2.5
Illicit drugs and psychoactive medication	0.4
Alcohol, illicit drugs and psychoactive medication	0.6

Table 104: Prevalence of substances in general traffic, 2007-2009

Substance	Prevalence (%)
None	89.35
Alcohol	6.42
Illicit drugs only	0.64
Psychoactive medication only	2.98
Alcohol and illicit drugs	0.31
Illicit drugs and psychoactive medication	0.30

[301] The objective of DRUID (Driving under the Influence of Drugs, Alcohol and Medicines) is to give scientific support to the EU transport policy to reduce impaired driving.
[302] No Belgian data is available on the prevalence of alcohol and psychoactive substances in killed drivers. Therefore, we make the assumption that the prevalence of substances in seriously injured drivers is the same for killed drivers.
[303] This data of the DRUID study is preferred since the prevalence of alcohol, illegal drugs, psychoactive medication and various substance combinations is measured. The Belgian police only has data on the number of drivers under influence of alcohol or illegal drugs (2012: 270,875 drivers were tested of which 2.41% was under the influence of alcohol and 0.05% of illegal drugs).
[304] The group of psychoactive medication is formed by benzodiazepines, Z-drugs and medicinal opiates and opioids.

1.3. Calculation methods used

1.3.1. Direct costs

1.3.1.1. Health related costs

Inpatient Care: General hospitals

The calculation of the substance-attributable costs for inpatient hospital and for the hospital day care episodes was calculated by multiplying the SAFs, the number of hospital care episodes and the weighted average unit cost for motor vehicle traffic accidents[305]:

*Attributable cost= SAF * hospital care episodes * weighted mean cost*

The substance attributable fractions from the DRUID-study are used (Isalberti et al., 2011), since this study reports the prevalence of alcohol and other psychoactive substances for injured drivers. The number of hospital care episodes is retrieved from the 'Minimum Hospital Data' (MH ('Minimale Ziekenhuisgegevens' [MZG]/'Résumé Hospitalier Minimal' [RHM]). This database contains hospital-based data including medical data, nursing-based data, administrative data (Federal Public Service (FPS) Health, 2015).[306] Furthermore, the weighted mean unit cost was calculated by taking into account the distribution of the number of cases/ICD-9 diagnosis over the APR-DRGs and the corresponding cost/APR-DRG.[307] This cost calculation for traffic accidents resulted in an average cost of 6,162 euros for inpatient hospital care and 656 euros for hospital day care.

Prevention and research

The expenditures for the category prevention and research have been provided by the Belgian Road Safety Institute. No further calculations are necessary, since the cost for each substance have been reported.

1.3.1.2. Crime related costs

The methods to estimate the costs for investigation, sentencing and sentence execution are reported in the methodology of the section crime.

[305] In accordance with the MAIS study, the cost calculation for motor vehicle traffic accidents is based upon the E-codes E810–E819, E826, E827 and E829. These E-codes include motor vehicle traffic accident involving collision with motor vehicles, other vehicles and pedestrians.

[306] In the SWOT analysis, we will estimate the costs for traffic victims based upon the results of the MAIS study (Nuyttens & Van Belleghem, 2014). This MAIS-study reports the number of injured road traffic victims (that were hospitalised for at least one night) for different types of road users. Furthermore, this alternative calculation method will take into account the SAF by type of vehicle.

[307] The cost data for the inpatient hospital and for the surgical hospital day care episodes were derived from the 'National Database Medical Diagnosis/Care and Cost' (Federal Public Service & National Institute for Health and Disability Insurance, 2015).

1.3.2. Indirect costs

Productivity losses due to premature mortality

Motor vehicle accidents caused by substances may lead to premature death and this results in lost work days. As discussed in the section health (chapter 1.3.2.2.) and crime (chapter 1.4.2.), the costs resulting from this lost productivity can be calculated as follows:

$$Attributable\ cost = SAF_{age\text{- and sex-specific}} * YLL_{disease\text{-specific}} * annual\ labour\ cost * mean\ employment\ rate$$

We used the substance attributable fractions from the DRUID study that estimated the prevalence of injured drivers (Isalberti et al., 2011). Furthermore, the database of the Federal Public Service Economy reports 575 deaths due to motor vehicle accidents in 2012. Taking into account a potential productive life up to the age of 65, this results in 15,893 years of life lost (YLL). [308] This is multiplied with the annual mean labour cost of 49,156 euros[309] and the mean employment rate of 61.8%[310].

It should also be stated that the annual mean labour cost for the reference year 2012 was halved assuming that some premature mortality cases occurred at the beginning of the year and others at the end.

1.3.3. Intangibles

Similar to health and crime, we use the 'Disability-Adjusted Life Years' approach or DALY-approach to estimate the intangible costs related to traffic accidents. DALY's are calculated as the years of life lived with disability (YLD) and the years of life lost due to premature death (YLL). For 2012, the World Health Organization estimated that 70,000 DALY's were lost due to road injuries in Belgium.[311] This number is multiplied with the value of 40,000 euros per DALY (Desaigues et al., 2007). Furthermore, the fractions of the DRUID study (Isalberti et al., 2011) are applied to quantify the substance-attributable number of DALYs.

[308] Data related to the number of deaths per ICD-10 diagnosis for the year 2012 was obtained in writing from Statistics Belgium on 12/05/2015 (excel-file)
[309] SPF ECONOMICS, http://statbel.fgov.be/nl/statistieken/cijfers/arbeid_leven/lonen/activiteit/.
[310] This information was derived from the FPS Economy website on 12/05/2015
[311] WHO, 2012, http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html

2. RESULTS

2.1. DIRECT COSTS

A. Health related costs

2.1.1. Inpatient care

General hospitals

In 2011, the general hospitals registered 15,914 inpatient care episodes and 2,361 day care cases for road traffic accidents. Based upon this data, the total hospitalisation cost (including inpatient care and hospital day care) for substance-attributable traffic accidents was estimated to be 36,444,913 euros (Table 105). The majority of these costs were due to alcohol (approximately 20 million euros).

Table 105: Substance-attributable hospitalisation (inpatient & day care) costs /substance in general hospitals, 2012

substance	inpatient care cost (euros)	inpatient care proportion	hospital day care cost (euros)	hospital day care proportion	overall total cost (euros)	overall total proportion
Alcohol	19,905,020	54.86%	99,361	60.28%	20,004,381	54.89%
Illicit drugs	4,804,660	13.24%	9,905	6.01%	4,814,565	13.21%
Psychoactive medication	5,392,986	14.86%	46,121	27.98%	5,439,106	14.92%
Alcohol and illicit drugs	2,745,520	7.57%	4,798	2.91%	2,750,318	7.55%
Alcohol and psychoactive medication[312]	2,451,357	6.76%	/	/	2,451,357	6.73%
Illicit drugs and psychoactive medication	392,217	1.08%	4,643	2.82%	396,860	1.09%
Alcohol, illicit drugs and psychoactive medication	588,326	1.62%	/	/	588,326	1.61%
Total	**36,280,086**	**100%**	**164,827**	**100%**	**36,444,913**	**100%**

[312] The DRUID study (Houwing et al., 2011) did not report any prevalence rates for the substance group "alcohol and psychoactive medication" and "alcohol, illicit drugs and psychoactive medication".

2.1.2. Prevention

Belgian Road Safety Institute *(Belgisch instituut voor de verkeersveiligheid/Institut Belge pour la sécurité routière)*
The Belgian Road Safety Institute (BRSI) organises so-called 'BOB campaigns' to prevent drunk driving. The main objective is to reduce the number of alcohol-related accidents by deterring and preventing drunk driving. In 2012, the BOB summer-campaign was visible through posters on motorways and festivals. The BOB "end of year"-campaign focused on the benefits of being the "Bob". The campaign was reinforced by police breath tests. In 2012, the BRSI has also organised photo kiosks at 63 clubs and 13 festivals across Belgium. These photo kiosks provide information on four topics, including driving under the influence of alcohol and illicit drugs.

The BRSI has also been a supporting partner of the Quality Nights Label for party venues (developed by Modus Vivendi and VAD) since the road safety pillar is a criterion of this quality mark. The road safety pillar contains three mandatory elements: communication about alternatives for transport home, offering (disposable) alcohol tests and awareness-raising in and around the establishment.

These prevention initiatives of the BRSI cost 655,500 euros, 95% (622,725 euros) of these costs can be attributed to alcohol and 5 % (32,775 euros) to illegal drugs. 65% of this prevention budget is paid by sponsoring organisations (Assuralia[313] and the Belgian Brewers) and 35% by the government.[314]

2.1.3. Research

Road Safety Knowledge Centre *(Kenniscentrum verkeersveiligheid/Centre de connaissance sécurité routière)*
The Road Safety Knowledge Centre (department of the BRSI) contributes to research with the publication of traffic accident statistics, by participation in national and international research, and in measuring the behaviour and attitudes of road-users and carrying out thematic, in-depth research. In 2012, the road safety knowledge centre employs 15.5 FTE with a budget of 1,230,000 euros, 12% (147,600 euros) can be attributed to alcohol and 3% (36,900 euros) to illegal drugs and psychoactive medication.[315]

[313] Federation of the Belgian insurance companies
[314] This information was provided in writing by the Belgian Road Safety Institute, 09/12/2014 and 06/05/2015.
[315] This information was provided in writing by the Belgian Road Safety Institute, 09/12/2014.

B. Crime related costs

2.1.4. Investigation

Federal and local police *(Federale en lokale politie / Police fédérale et locale)*

The federal and local police detect drivers under the influence of alcohol or illegal drugs (cfr. Road Traffic law of 16 March 1968). In order to calculate the costs, the total budget of the federal and local police 2012 is multiplied with the share of substance attributable road traffic offences. A total of 5,739,740 offences were recorded by the integrated police, of which 1,035,567 were criminal offences, 52,988 were violations of police regulations[316] and 4,651,261 were traffic incidents. Of these violations, 46,185 cases of alcohol in traffic (0.80%) were registered and 2,559 (0.04%) cases of illegal drugs in traffic.[317] These fractions are applied to the total budget of the local and federal police, and result in a cost of 30,496,225 euros for alcohol and 1,524,811 euros for illegal drugs. Table 106 and Table 107 give an overview of the police costs associated with driving under the influence of alcohol and illegal drugs

Table 106: Overview calculation expenditures federal police, 2012

Expenditure category	Total budget (euro)	Fraction specific offence	Cost
Traffic illegal drugs	1,091,276,122	0.04%	436,510
Traffic alcohol	1,091,276,122	0.80%	8,730,209
		Total	**9,166,719**

Table 107: Overview calculation expenditures local police, 2012

Expenditure category	Total budget (euro)	Fraction specific offence	Substance Attributable fraction	Cost
Traffic illegal drugs	2,720,752,000	0.04%	100%	1,088,301
Traffic alcohol	2,720,752,000	0.80%	100%	21,766,016
			Total	**22,854,317**

2.1.5. Sentencing

General Courts *(Rechtbanken/Tribunaux)*

The costs related to traffic offences are measured with the same procedure as for the calculation of the public prosecutor's expenditures. For the year 2012, it can be estimated that a budget of 547,271,083 euros (65.01% of the budget of 'legal authorities'[318]) is attributed to the general courts. The costs for criminal cases are calculated by applying a proportion of 30.16%[319]. Next, the share of registered illegal

[316] FEDERAL POLICE, Criminal statistics 2000-2012. http://www.polfed-fedpol.be/crim/crim_statistieken/stat_2013_trim4_nl.php
[317] This information was provided in writing by the Federal Police, department of Police Information and ICT, 27/01/2015 and 11/02/2015.
[318] This information was provided in writing by the SPF Justice, Directorate General of the Judicial Order, 17/10/2014
[319] Since the general courts closed a total of 1,195,745 cases of which 360,599 (30.16%) were criminal cases.

drugs and alcohol in traffic violations have to be determined. Table 108 shows that 1,10% of the convictions were for illegal drugs in traffic and 12,12% for alcohol in traffic[320]. This calculation results in a total cost of 21,120,677 euros for traffic violations, as can be seen in Table 108.

Table 108: Overview calculations expenditures general courts, 2012

Expenditure category	Total budget (euros)	Fraction general courts	Fraction criminal cases	Fraction specific offence	Substance Attributable fraction	Total cost
Traffic illegal drugs	841,826,000	65.01%	30.16%	1.10%	100%	1,757,394
Traffic Alcohol	841,826,000	65.01%	30.6%	12.12%	100%	19,363,283
					Total	**21,120,677**

Legal aid *(Gerechtelijke bijstand/Aide judicaire)*

Every individual that is impecunious or has no sufficient income is given access to (free) legal aid. [321] According to the federal budget 86,797,000 euros were spent on legal aid in 2012.[322] The costs for criminal cases are calculated by applying a proportion of 30.16%[323]. Next, the fraction of registered illegal drugs and alcohol traffic violations are used. This results in a total cost of 3,460,729 euros, as is shown in Table 109.

Table 109: Overview calculation expenditures legal aid, 2012

Expenditure category	Total budget (euros)	Fraction criminal cases	Fraction specific offence	Substance Attributable fraction	Total cost (euros)
Traffic illegal drugs	86,797,000	30.16%	1.10%	100%	287,958
Traffic Alcohol	86,797,000	30.16%	12.12%	100%	3,172,771
				Total	**3,460,729**

Legal expenses *(Gerechtskosten/Frais judiciaires)*

The justice system spends money on tests in order to detect alcohol and drugs intoxication in traffic. In 2012, 40,590 euros was spent on blood tests in traffic; 8,203 euros on urine tests in traffic; and 83,520 euros on saliva tests in traffic[324]. Together this makes for a total expenditure of 132,313 euros on legal expenses.

SPF JUSTICE, VBSW, Kerncijfers van de gerechtelijke activiteit 2000-2012, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/. This data were verbally confirmed and corrected were needed by the VBSW, 18/11/2014.

[320] SPF JUSTICE, Department of Criminal Policy, Convictions, internments and suspensions: http://www.dsb-spc.be/web/index.php?option=com_content&task=view&id=28&Itemid=47&lang=dutch

[321] Artikel 23, derde lid, 3° Grondwet

[322] FEDERAL BUDGET 2012, FPS Justice (56)-01.

[323] Since the general courts closed a total of 1,195,745 cases of which 360,599 (30.16%) were criminal cases.
SPF JUSTICE, VBSW, Kerncijfers van de gerechtelijke activiteit 2000-2012, Brussels 2012: http://justitie.belgium.be/nl/informatie/statistieken/hoven_en_rechtbanken/. This data were verbally confirmed and corrected were needed by the VBSW, 18/11/2014.

[324] This information was provided in writing by the Directorate General of the Judicial Order, 11/12/2014.

2.1.6. Sentence execution[325]

Penitentiary Institutions (Strafinrichtingen / Centre Pénitentiaire)

For the correctional facilities, no minimum cost calculation[326] is possible, since no single traffic offences have been reported. We estimate the maximum cost related to alcohol intoxication in traffic. This maximum calculation takes into account the incarcerations for a traffic offence among other offences (e.g. a violent crime and a property crime). Based upon 109 incarcerations for drivers in state of alcohol intoxication and an average daily detention cost of 136.84 euros[327], the maximum cost is estimated to be 5,459,095 euros in 2012.

Sentencing court (*Strafuitvoeringsrechtbank/Tribunal de l'application des peines)*

Similar to the cost calculation of incarceration, we estimate the minimum and maximum cost of the sentencing courts related to traffic offences. In 2012, the legal authorities had a total budget of 814.826.000 euros, of which 0.81% (6,646,215 euros) is linked to the sentencing courts.[328] Furthermore, the sentencing courts took a decision for 8,256 cases, of which minimum one decision and maximum 173 decisions for alcohol related traffic offence.[329] This results in a minimum cost of 800 euros and a maximum cost of 138,335 euros. This means an average expenditure on alcohol related traffic offences by the sentencing courts of 69,568 euros.

Re-instatement assessments (Herstelonderzoek / Examens de réintégration)

According to article 73 of the Royal Decree 23/03/1998 on the driving licence regulations, a driver deprived of the right to drive may be imposed to undergo medical and/or psychological assessments in order to retrieve the driver's licence. In 2012, the BRSI conducted 5,114 medical and/or psychological assessments.[330] Nine other organisations (AXIOS, Experconsult, Instituut voor psychomedische testing IPMT, Dilopsy, Psyconsult VOF, Accès-Conduite-ADR A.B.S.L., Service Psycho Médico Juridique SPMJ and Psycho-Medisch Advies[331]) are also recognized by the Federal Public Service to conduct a re-instatement assessment. The total number of assessments of these nine organisations is not available for the year 2012, therefore, data of 2010 are used to estimate the costs for re-instatement assessments. The number of candidates for the ten organisations (2010: 11,608 candidates) is multiplied with the maximum price for a medical (2012: 91 euros) and psychological assessment (2012: 308 euros).[332] This results in a total cost of 4,631,592 euros. This cost is probably an overestimation, since the assessment centres might

[325] The alcohol locks also belong to the category of sentence execution, however no costs are reported during the year 2012 (alcohol locks have been introduced in 2013).
[326] The minimum calculation only takes incarcerations into account for a single offence (e.g. only a violent crime).
[327] This number was provided in writing by the FPS JUSTICE, General Directorate of Correctional Facilities, Department of Information Management, 10/04/2015. This estimate includes the cost of regular incarceration, internments and incarcerations at the Dutch prison of Tilburg. The calculation is based on the federal budget 2012 and the average day-population.
[328] Of the 2,452 magistrates working for the general courts, 20 (0,81%) are linked to the sentencing courts.
[329] These data were provided in writing by the FPS JUSTICE, General Directorate of Correctional Facilities, Department of Management Information, 24/04/2015.
[330] This information was provided in writing by the Belgian Road Safety Institute, 09/12/2014 and 06/05/2015.
[331] In 2013, Psypunt and Neuropsychologie Tournai have also been recognized as assessment centres.
[332] This information was provided in writing by the Belgian Road Safety Institute, 09/12/2014 and 06/05/2015.

charge a lower price.[333] Moreover, the candidates are not always required to conduct medical as well as psychological assessments. In 2014, 96.81% of the candidates conducted a medical and psychological assessment, 0.81% a psychological assessment and 2.38% a medical assessment.

Alternative sanctions and measures *(Alternatieve gerechtelijke maatregelen/des mesures judiciaires alternatives)*

a. Global Plan (Globaal plan / Plan global)

In 2012 a budget of 6.236.381,40 euros was made available through the Global Fund for two training projects: "driving under the influence of alcohol" (organised by Groep Intro) and "drugs in traffic" (organised by the CGG Waas en Dender, under supervision of the BRSI). Table 110 presents the costs of these projects linked to drunk and illegal drug driving.

Table 110: Overview expenditures AGM projects -Global Fund – Substance abuse, 2012

Organization	Local Authority	Focus	Budget 2012 (euros)
CGG Waas en Dender – afdeling verslavingszorg	Sint-Niklaas	Illegal drugs	32.266
Groep Intro	Sint-Niklaas	Alcohol	16,113
		Total	**48,379**

b. Road Safety Fund (Verkeersveiligheidsfonds / *Fonds de* sécurité routière)

The Road Safety Fund is used to fund projects that aim at improving road safety. More specifically the Belgian Road Safety Institute (BRSI) and the Pro Velo project received 1,505,416 euros in 2012.[334] In order to determine the share for alcohol and illegal drugs, both projects are discussed more in detail.

Driver improvement courses are alternative measures (Royal Decree of 6/10/1996 on community work and educative projects; Law on Probation of 10/02/1994) at the level of the public prosecutor via penal mediation or at the level of the court within probation. The BRSI report the average price per participant of 659 euros for Dutch courses and 853 euros for French courses. In 2012, 649 alcohol dossiers have been accomplished (for accidents, hit-and-run, and being under the influence of alcohol) and 50 for illegal drugs.[335] This makes a total cost of 539,981 euros, of which 491,905 euros for alcohol and 48,076 for illegal drugs.

Moreover, the Road Safety Fund has financed Pro Vélo for the community service sentences project. During this project, the offenders help with the organisation of safe *bicycle* riding training. In 2012, Pro Vélo received 79,117 euros for the community service of 104 convicted traffic offenders. However, the type of traffic violation of these offenders is unknown, therefore it is not possible to determine the percentage alcohol or illegal drugs.[336]

[333] For example, the organisations BRSI and IPMT charge the maximum price, and Psyconsult is 6.5% cheaper (based on 2014 prices).

[334] This information was provided in writing by the department of Wellbeing, Public Health and Family, Service of Houses of Justice, of the Flemish Government on 15/03/2015.

[335] This information was provided in writing by the Belgian Road Safety Institute, 09/12/2014 and 06/05/2015.

[336] This information was provided in writing by Pro Vélo, 12/05/2015.

2.2. INDIRECT COSTS

Productivity losses due to premature mortality

In 2012, the number of life years lost up to the age of 65 years was estimated to be 15,893 for motor vehicle accidents.[337] Furthermore, the average yearly labour cost in 2012 is 49,156 euros and the population economically active rate is 61.8%.[338] Taking into account these data and using the substance attributable fractions of the DRUID-study (Isalberti et al., 2011), this means a productivity loss caused by substance related road accidents of approximately 175 million euros. In Table 111, the total substance-attributable costs are divided into those that can be assigned to the reference year 2012 and those that arise from productivity losses in future years (up to the age of 65 years).

Table 111: Substance-attributable expenditures associated with premature mortality, for the reference year 2012 and for future years

Substance	proportion	costs 2012 (euros)	costs future years	total
Alcohol	20.3 %	1,772,960	94,463,300	96,236,260
Illicit drugs	4.9%	427,956	22,801,486	23,229,442
Psychoactive medication	5.5%	480,359	25,593,505	26,073,864
Alcohol and illegal drugs	2.8%	244,546	13,029,421	13,273,967
Alcohol and psychoactive medication	2.5%	218,345	11,633,411	11,851,756
Illicit drugs and psychoactive medication	0.4%	34,935	1,861,346	1,896,281
Alcohol, illicit drugs and psychoactive medication	0.6%	52,403	2,792,019	2,844,422
Total	**37%**	**3,231,503**	**172,174,488**	**175,405,991**

Productivity losses due to incarceration

The lost productivity due to incarceration is calculated for alcohol related traffic offences. The maximum cost estimation is based upon 109 incarcerations for drivers in state of alcohol intoxication. Furthermore, we take into account an average daily labour cost of 134,3 euros[339] and an economically active fraction of 24.9% (prior to detention).[340] This results in a maximum estimation of productivity loss due to incarceration of 1,334,143 euros. The minimum cost calculation is not possible, since no single traffic offences have been reported.

[337] SPF ECONOMICS, Statistics Belgium, http://statbel.fgov.be/. These specific numbers have not yet been published online.
[338] SPF ECONOMICS, http://statbel.fgov.be/nl/statistieken/cijfers/arbeid_leven/lonen/activiteit/.
[339] Based upon the average yearly labour costs of 49,156 euros in 2012 (FPS ECONOMICS, http://statbel.fgov.be/nl/statistieken/cijfers/arbeid_leven/lonen/activiteit/). This is most likely an overestimation of the average wage of detainees since it was not possible to control for influencing factors such as educational level, sector etc.
[340] WODC, Dutch Ministry of Security and Justice, Annual report on the aftercare of ex-detainees: https://www.wodc.nl/onderzoeksdatabase/monitor-nazorg-2010-3e-meting.aspx

2.3. INTANGIBLES

In order to estimate intangible costs linked to substance attributable traffic accidents we use the method of Disability Adjusted Life Years (DALY). The World Health Organization estimates that in 2012, 70,000 DALY's were lost due to road injuries in Belgium.[341] If we multiply this by the agreed value of 1 DALY, 40,000 euros (Desaigues et al., 2007), we obtain a loss of 2.8 billion euros on pain and suffering caused by road traffic accidents in Belgium, 2012. Multiplied by the substance attributable fractions of the DRUID-study (Isalberti et al., 2011), this means a total expenditure of approximately 1 billion euros (Table 112).

Table 112: Substance-attributable intangibles costs on traffic, 2012

Substance	proportion	cost (euros)
Alcohol	20.3 %	568,400,000
Illicit drugs	4.9%	137,200,000
Psychoactive medication	5.5%	154,000,000
Alcohol and illegal drugs	2.8%	78,400,000
Alcohol and psychoactive medication	2.5%	70,000,000
Illicit drugs and psychoactive medication	0.4%	11,200,000
Alcohol, illicit drugs and psychoactive medication	0.6%	16,800,000
Total	**37%**	**1,036,000,000**

[341] WHO, 2012, http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html
The road injuries mentioned in the ICD10 data: V01-V04, V06, V09-V80, V87, V89 and V99.

3. OVERVIEW OF COSTS FOR TRAFFIC

Table 113: Substance attributable costs of traffic, 2012

	DIRECT COSTS							
	ILLEGAL DRUGS	ALCOHOL	PSYCOACTIVE MEDICATION	OTHER (ALC AND ID)	OTHER (ID AND PM)	OTHER (ALC AND PM)	OTHER (ALC, ID AND PM)	TOTAL
HEALTH RELATED COSTS								
HOSPITALISATION	4,814,565	20,004,381	5,439,106	2,750,318	396,860	2,451,357	588,326	**36,444,913**
PREVENTION	32,775	622,725						**655,500**
RESEARCH		147,600			36,900			**184,500**
SUBTOTAL	5,105,339	21,785,234	5,693,694	2,898,608	450,987	2,588,043	621,130	**39,143,035**
CRIME RELATED COSTS								
INVESTIGATION	1,524,811	30,496,225						**32,021,036**
SENTENCING	1,757,394	19,363,283		132,313				**21,252,990**
SENTENCE EXECUTION	80,342	3,307,134		4,710,709				**8,098,185**
SUBTOTAL	3,362,547	53,166,642		4.843.022				**61,372,211**
TOTAL DIRECT COSTS	**8,467,886**	**74,951,876**	**5,693,694**	**7,741,630**	**450,987**	**2,588,043**	**621,130**	**100,515,246**
PROPORTION	**8.4%**	**74.57%**	**5.66%**	**7.70%**	**0.45%**	**2.57%**	**0.62%**	**100%**

INDIRECT COSTS								
	ILLEGAL DRUGS	ALCOHOL	PSYCOACTIVE MEDICATION	OTHER (ALC AND ID)	OTHER (ID AND PM)	OTHER (ALC AND PM)	OTHER (ALC, ID AND PM)	TOTAL
PRODUCTIVITY LOSSES DUE TO INCARCERATION (MAXIMUM COST)		1,452,019						**1,452,019**
PRODUCTIVITY LOSSES FROM PREMATURE MORTALITY								
YEAR 2012	427,956	1,772,960	480,359	244,546	34,935	218,345	52,403	**3,231,503**
FUTURE YEARS	22,801,486	94,463,300	25,593,505	13,029,421	1,861,346	11,633,411	2,792,019	**172,174,488**
TOTAL INDIRECT COSTS	**23,229,442**	**97,688,279**	**26,073,864**	**13,273,967**	**1,896,281**	**11,851,756**	**2,844,422**	176,858,010
PROPORTION	**13.13%**	**55,24%**	**14.74%**	**7.51%**	**1.07%**	**6.70%**	**1.61%**	100%

INTANGIBLES								
	ILLEGAL DRUGS	ALCOHOL	PSYCOACTIVE MEDICATION	OTHER (ALC AND ID)	OTHER (ID AND PM)	OTHER (ALC AND PM)	OTHER (ALC, ID AND PM)	TOTAL
NON-FINANCIAL WELFARE COSTS	137,200,000	568,400,000	154,000,000	78,400,000	11,200,000	70,000,000	16,800,000	**1,036,000,000**
PROPORTION	**13.24%**	**54.86%**	**14.86%**	**7.57%**	**1.08%**	**6.76%**	**1.62%**	100%

INTEGRATED PROJECTS

1. METHODS

The category integrated projects has been created for the federal research programme drugs and the general drugs policy cell, since these direct costs could not be attributed to the cost category of health, crime or traffic. The expenditures for these integrated projects are substance specific. No further calculations are necessary, because the expenditures are exclusively used for substance policy.

2. RESULTS

2.1. DIRECT COSTS

2.1.1. Research

Federal research programme Drugs of BELSPO

The Federal research programme Drugs of BELSPO financed, amongst other studies, the study 'Drugs in Figures III' in 2012. This research estimated the public expenditures on alcohol, illicit drugs, psychoactive medication and tobacco. The funding of this research and the operational expenses of the research programme Drugs are attributed to this category of integrated projects (given the focus on crime and health). Together this makes for a total expenditure of 80,315 euros.[342]

2.1.2. Coordination

General Drugs Policy Cell

The General Drugs Policy Cell is responsible for the coordination of the Belgian substance policy. The objective is to achieve an efficient drugs policy with a global and integrated approach. Therefore, a cooperation with 17 representatives of the Federal Government and 18 representatives of the Regional Governments, a coordinator and a vice-coordinator have been established. In 2012, the General Drugs Policy Cell received a total budget of 194,823 euros from the federal and regional governments. Table 114 presents an overview of the funding of the General Drugs Policy Cell.

Table 114: Funding of the General Drugs Policy Cell by type of government, 2012

Government	Federal	Flemish government	French Community Wallonia-Brussels	Walloon region	Brussels - capital	COCOF	COCOM	German-speaking Community
Proportion of budget	50%	22%	6%	9%	3%	3%	6%	1%
Budget (euros)	97,411	42,861	11,689	17,534	5,845	11,689	5,845	1,948

[342] This information was provided in writing by the Belgian Science Policy, 03/11/2014.

3. OVERVIEW OF COSTS FOR INTEGRATED PROJECTS

Table 115: Substance attributable costs of integrated projects, 2012

DIRECT COSTS						
	Illegal drugs	Alcohol	Psychoactive Medication	Tobacco	Other (TOB, ID, ALC and PM)	Total
Research						
Federal research programme Drugs (BELSPO)					80,315	**80,315**
Coordination						
General Drugs Policy Cell					194,823	**194,823**
TOTAL DIRECT COSTS					**275,138**	**275,138**
Proportion					**100%**	**100%**

OVERVIEW OF MISSING COSTS

Table 116 clarifies the costs that could not be calculated for the year 2012 due to missing data and/or flawed calculations. Table 117 provides an overview of the costs that did not occur in the year 2012.

Table 116: Overview of unmeasurable costs

Type of cost	Reason
HEALTH	
Direct costs: Outpatient care	
Ambulatory Accident and Emergency Department	No data available based on ICD-10 diagnoses. Today, within the UREG-registration[343], the registration of diseases based on ICD-10 diagnosis is optional. From 2016 on, this will be compulsory
Mental health care centre (SSM)	No centralised registration in SSM No data via TDI registration (only 5 out of 111 SSM/CGG registered TDI in 2012)
Pharmaceuticals in inpatient psychiatric facilities	Cost data related to hospital care episodes in psychiatric facilities (both psychiatric hospitals and psychiatric wards in general hospitals) were not included in the 'National Database Medical Diagnosis/Care and Cost' database. As far as is known, no cost data is available related to the substance-attributable costs for pharmaceuticals in inpatient psychiatric facilities.
Non-medical home care e.g. Familiehulp, Familiezorg, Solidariteit voor het Gezin, Landelijke Thuiszorg, Onafhankelijke Thuiszorgverenigingen (OTV), Centrale de Services à Domicile - Solidaris-Mutualité Socialiste, Aide et Soins à domicile-Mutualité chrétienne, Aides familiales-Omnimut-Mutualité Liberale Wallonie	No data for the substance attributable fraction – no data related to the number of people receiving non-medical home care associated with substance (mis)use
Direct costs: Social work services	
Public Centres for Social Welfare	No data via the top down method
Direct costs: Coordination	
Overlegplatform Geestelijke Gezondheidszorg Gebied Brussel (GGC)	Not possible to determine the substance attributable fraction
Provinces	The province Namur did not participate in the SOCOST study.
Indirect costs	
Short-term disability	Costs associated with productivity losses during the first week (for workers) and during the first month (for clerks) of disability are not taken into account

[343] UREG is a registration system from the FPS Public Health including administrative and medical data related to emergency department visits –this information was orally obtained from Door Lauwaert (Vlaamse Vereniging Verpleegkundigen Spoedgevallenzorg vzw) on 04/05/2015.

	in the calculation of the short-term disability costs (they are covered by a guaranteed wage)
Social integration benefit	The social integration benefit is a transfer cost since the transfer of ownership from the payer to the receiver does not affect the amount of resources available to society (Moore & Caulkins 2006, Single 2003). However, it should be stated that this cost should not be underestimated. In 2011, 478 million euros have been paid to approximately 155,115 people with a living wage.[344] Nevertheless, it is not possible to estimate the fraction of living wages caused by substance misuse without taking a survey of the Public Centres for Social Welfare.[345]
Unemployment benefit	Formula: Yearly unemployment benefit * extra number of unemployed people due to substances No Belgian data on the number of unemployed people due to substances
Absenteeism + presenteeism	Formula for absenteeism: number of working people under influence of substances * mean employment rate * 0,044% (proportion productivity loss due to absenteeism) No Belgian data on the number of working people under influence of substances
CRIME	
All	
Tobacco attributable non-consensual crimes	No data for the tobacco attributable fractions
Psychoactive medication attributable non-consensual crimes	No data for the psychoactive medication attributable fractions
Direct costs: Investigation	
Jury for Ethical Practises in Advertising	The Jury for ethical practices in advertising is the self-disciplinary organ of the advertising sector in Belgium. The jury verifies whether advertising messages distributed by the media, are in line with rules regarding ethical advertising, based on Belgian laws and self-disciplinary codes within the sector. In 2012, the jury opened 101 new cases, based on 344 complaints. In addition it gave policy advise in 23 cases. Of this total of 124 cases, 18 (14.52%) cases referred to alcohol (10 complaints and 8 policy advise), and 2 referend to medication (1.61%).[346] However, it is not possible to calculate substance attributable expenses for JEP since a total budget could not be provided.[347]

[344] Belgische kamer van volksvertegenwoordigers, Schriftelijke vragen en antwoorden 03/06/2013: https://www.dekamer.be/QRVA/pdf/53/53K0115.pdf

[345] This information was provided in writing by the Association of Flemish Cities and Municipalities (VVSG - Vereniging voor Steden en Gemeenten), 15/07/2015.

[346] JURY for ETHICAL PRACTICES in ADVERTISING, Evaluation report alcohol 2012: http://www.jep.be/nl/extra-info/evaluatieverslagen/

[347] This information was provided in writing by the JURY for ETHICAL PRACTICES, on 12/08/2015.

Direct costs: Sentencing	
Closed federal youth institutions	In 2012 there were three closed federal youth institutions in Belgium: Everberg, Saint-Hubert and Tongeren.[348] In 2012 a realized budget of 12,384,000 euros for the federal youth institutions (Everberg, Saint-Hubert and Tongeren) was outlined.[349] Unfortunately no substance attributable costs can be calculated for the closed institutions of Everberg and Tongeren since there are no data available on the number of placements/population by type of offence. [350] The expenditures for Saint-Hubert are included in the calculations for the community youth institutions of the French speaking community.
Flemish community youth institutions	In the Dutch speaking community there were 2 community institutions in 2012: De Kempen en De Zande, with each 2 campuses. In 2012 these institutions had a combined budget of 76,985,000 euros, of which 64,426,000 personnel costs, 5,785,000 operational expenses and 6,774,000 investment costs. However, there are no data available on the number of youth directed to one of these institutions by type of offence. This means it is not possible to calculate addictive substance abuse related costs for the Dutch speaking youth institutions.
Civil service and fire department	Expenditures related to civil services and the fire department can in some cases be attributed to substance misuse. Some examples are fires that are caused by burning cigarettes, beer cans, or interventions for traffic accidents caused by substance misuse. In 2012 the federal government allocated a total budget of 47,630,823.5 euros to the fire department. This number does not include contributions by other governmental levels such as the provinces (functioning and personnel costs) and the local communities (equipment, training etc.). In 2012 the fire department counted 149,035 interventions. Of those, 21,616 interventions were for fires and 47 for explosions. However, the cause of these fires is only reported in a small minority of cases (approximately 20% of all the registered cases). Also, the fire departments have no information on the possible intoxication of the individuals involved in accidents. This means it is not possible to calculate the expenditure on alcohol and tobacco related fire department interventions.
Direct costs: Research	
National Institute for Criminalistics and Criminology (NICC)	The NICC is a federal scientific institution within the FPS Justice, which delivers scientific research on demand of the legal authorities. The main task of the NICC is to deliver forensic research in Belgium and provide scientific support to criminal and legal investigation. The institute has two main departments • The department of criminalistics: identification and analysis of

[348] FPS JUSTICE, http://justitie.belgium.be/nl/themas_en_dossiers/gevangenissen/belgische_gevangenissen/gesloten_federale_centra_voor_jongeren/

[349] FEDERAL BUDGET, FPS Justice (51) 01.

[350] This information was provided in writing by FPS JUSTICE, General directorate of penitentiary institutions on 10/04/2015 and confirmed in writing by the Youth Institution of Everberg on 14/04/2015 and Tongeren on 17/04/2015.

	evidence of crimes and modus operandi. One of the domains of expertise is drugs and toxicology. • The department of criminology: scientific research into the functioning of the judicial system. The federal budget reported a realized budget of 11,385,000 euros for the NICC.[351] Although the activities and expenditures of the NICC can certainly be linked to substance use and misuse, it was not possible to calculate any costs because the relevant budgets/expenses were not made available.[352]
TRAFFIC	
Direct costs: Outpatient care	
Ambulatory Accident and Emergency Department	No data available based on ICD-10 diagnoses. Today, within the UREG-registration[353], the registration of diseases based on ICD-10 diagnosis is optional. From 2016 on, this will be compulsory.[354]
Direct costs: Prosecution	
Public prosecutor's office	No cost calculation for traffic offences on the level of prosecution is possible, since no data on alcohol/illegal drugs in traffic is available.
Direct costs: Civil service and fire department	
Civil service and fire department (including urgent medical assistance / dringende medische hulp / aide médicale urgente)	The civil services and the fire department intervene in case of traffic accidents caused by substance misuse. For example, the fire department registered 149,035 interventions for urgent medical assistance (accidents) in 2012. However, it is not possible to calculate the expenditures of the civil services and the fire department for road accident interventions.[355] Firstly, the financial information on the fire departments is limited to the federal subsidies, the subsidies from other governments (such as provinces and local authorities) are not available.[356] Secondly, there are only intervention reports available for 182 of the 250 fire departments. Most importantly, these fire departments have no information at their disposal on the possible intoxication of the individuals involved in accidents.[357]

[351] FEDERAL BUDGET, FPS Justice, (62) 01.
[352] As informed by the NICC in writing on 18/05/2015.
[353] UREG is a registration system from the FPS Public Health including administrative and medical data related to emergency department visits –this information was orally obtained from Door Lauwaert (Vlaamse Vereniging Verpleegkundigen Spoedgevallenzorg vzw) on 04/05/2015.
[354] In the SWOT analysis, we will estimate the costs for traffic victims admitted to an emergency department, based upon the study of Devos, De Wit, Buyl, Hubloue, Lauwaert, Pien, et al. (2015).
[355] This information was provided in writing by the FPS INTERIOR, General Directorate Civil security, on 6/05/2015.
[356] This information was provided in writing by the FPS INTERIOR, General Directorate Civil security, on 6/05/2015.
In 2012, the federal government allocated 21,747,000 euros to the "pre-zones" and 18,102,127 euros to the municipalities.
[357] In the SWOT analysis, we will apply an alternative calculation method based on the study of De Brabander and Vereeck (2007).

Direct costs: Property loss	
Property loss due to traffic accidents (private cost)	Traffic accidents can lead to property damage of the vehicles. The estimation of these costs is based on insurance data. The compensations of insurance companies are transfer costs that do not affect the amount of resources available to society, nevertheless this data could be used as a proxy for the value of the lost or damaged goods. In 2012, the insurance companies paid 1376.9 million euros as financial compensation for the compulsory insurance "civil liability for motor vehicles" (burgerlijke aansprakelijkheid motorrijtuigen/ assurance responsabilité civile véhicules automoteurs). It is assumed that 70% of this amount (963.8 million euro) could be attributed to property damage.[358] The insurance companies also compensated material damage with additional insurances (Casco) for an amount of 843.5 million euros. It is not possible to estimate the damage costs for traffic accidents attributed to substance misuse, since Assuralia has no information about the insurance compensations for drivers in state of alcohol intoxication. This information is required for the cost calculation. The insurance contracts state that the insurance company will compensate property damage if the traffic accident is caused by a person in a state of alcoholic intoxication (not drunkenness). If the driver is in a state of drunkenness, the insurance company might exercise the right of recourse.[359] Remark: The cost calculation of property loss with insurance data will always result in a underestimation, since a part of the damage by traffic accidents is not claimed or compensated.
Indirect costs	
Productivity losses from disability	The expenditures related to short-term and long-term disability are health costs, including the productivity losses due to injury and poisoning. However, the disabled persons due to traffic accidents are situated in this category of injury and poisoning. It is not possible to report the productivity losses due to traffic accidents separately.
HEALTH, CRIME AND TRAFFIC	
Indirect costs	
Productivity losses: lost housework and lost schooldays	No data on the number of lost schooldays or housework due to substance (mis)use

[358] The compulsory insurance civil liability car covers material and physical damage. Physical damage was reported in 30% of all damage claims.

[359] This information was derived from the website from Assuralia on 17/08/2015 http://www.assuralia.be/index.php?id=194&L=0&tx_ttnews[tt_news]=1093&cHash=018962bf7d072efdf356bcddc306bf69

Table 117: Overview of costs that did not occur in the year 2012

HEALTH	
French Community Wallonia-Brussels « Actions de lutte et de prévention contre les assuétudes et la violence dans les écoles »	No projects on substances in the year 2012.
Stedenfonds	No projects on substances in the year 2012.
Provinces	The provinces Antwerpen and Henegouwen did not report any costs for the year 2012.
CRIME	
Investigation	
Europol	Europol is the European law enforcement agency that supports EU member states and their law enforcement authorities in preventing and combating all serious forms of international crime.[360] More specifically: organized crime, terrorism, murder, rape and organized/armed theft. Each member state has a Europol national unit that forms a liaison body between Europol and the own authorities. Each member states also seconds one liaison officer to Europol who represents his country at the Europol headquarters. In 2012 Europol counted a total expense of 84,152,000 euros.[361] Since 2009 Europol is financed directly from the EU community budget.[362] This means no cost can be calculated since there is no specific contribution made by Belgium in 2012.[363]
Prosecution	
Proefzorg	In 2005 a new project was launched, called Proefzorg, at the public prosecutor's office Ghent. The aim of this project was, and is, to guide users of illicit drugs who have committed small crimes, immediately and effectively to appropriate counselling, without the interference of the criminal court. In 2012 the Proefzorg project in its original form was still limited to the Public prosecutor's office of Ghent. In Dendermonde (2013) and Oudenaarde (2010) similar projects have been launched, but within the framework of mediation in criminal cases and as such did not imply extra costs.[364] In 2012 one judicial assistant was seconded to the Public prosecutor's office of Ghent as manager Proefzorg.[365] Although included on the payroll of the FPS Justice, this does not generate an extra cost since this function is an extra responsibility placed on an already employed judicial

[360] EUROPOL, https://www.europol.europa.eu/content/page/about-us
[361] EUROPOL, https://www.europol.europa.eu/category/publication-category/public-register/finance
[362] EUROPOL, https://www.europol.europa.eu/content/europol-budget-2012 ; Europa.eu, http://europa.eu/legislation_summaries/other/l33261_nl.htm
[363] This information was confirmed in writing by the FPS Justice, on 18/03/2015.
[364] This information was provided in writing by the Public Prosecutor's office Ghent, 30/01/15 and confirmed by the Public Prosecutor's office Oudenaarde, 16/02/15 and the Public Prosecutor's office Dendermonde, 30/01/15.
[365] This information was provided in writing by the Public Prosecutor's office Ghent, 30/01/15 and confirmed in writing by the Proefzorgmanager Ghent, 30/01/15.

	assistant. Together with two magistrates specialized in drug law offences, they formed the unit 'Proefzorg'. PopovGGZ coordinated the provided care and assistance.
Coordination	
UNODC	The United Nation Office on Drugs and Crime (UNODC) was established in 1997 through a merger between the United Nations Drug Control Programme and the Centre for International Crime Prevention. The UNODC is mandated to assist member states in their fight against illicit drug crime and terrorism. The UNODC is active in all regions of the world through an extensive network of field offices. The UNODC relies on voluntary contributions, mainly from governments (302.7 million US dollars in 2012). Due to budgetary cuts, Belgium has made no voluntary contribution since 2011.

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APPENDIX

Appendix 1a Overview of substance-attributable diseases: ALCOHOL

ICD-9	disease/condition	source
Neoplasms		
140-149; 230.0	lip, oral cavity, and pharynx cancer	Konnopka & König 2009
150; 230.1	oesophageal cancer	Konnopka & König 2009
153	colon cancer	Single et al. 2003
154.1	rectal cancer	Single et al. 2003
155	liver cancer	Konnopka & König 2009
157; 230.9	pancreatic cancer	Single et al. 2003
161; 231.0	laryngeal cancer	Konnopka & König 2009
174	breast cancer	Konnopka & König 2009
Nervous system		
331.7	degeneration of nervous system due to alcohol	Rehm et al. 2006
345	epilepsy	Konnopka & König 2009
357.5	alcoholic polyneuropathy	Single et al. 2003
Circulatory system		
401-405	hypertension	Single et al. 2003
410-414	ischaemic heart disease	Single et al. 2003
425.5	alcoholic cardiomyopathy	Single et al. 2003
427	cardiac arrhythmia	Single et al. 2003
428	heart failure	Single et al. 2003
430-432	ischaemic stroke	Single et al. 2003
433-437	haemorrhagic stroke	Single et al. 2003
456	oesophageal varices	Single et al. 2003
Metabolic diseases		
250	diabetes mellitus	Konnopka & König 2009
Perinatal diseases		
764-765	short gestation/low birthweight	Single et al. 2003
760.71	foetal alcohol syndrome	Rehm et al. 2006
Digestive system		
535.3	alcoholic gastritis	Single et al. 2003
571	alcoholic liver disease	Konnopka & König 2009
574	cholelithiasis	Single et al. 2003
577	acute pancreatitis	Single et al. 2003
577.1	chronic pancreatitis (alcohol induced)	Rehm et al. 2006
Mental disorders		
291	alcoholic psychosis	Single et al. 2003
305	alcohol abuse	Single et al. 2003
303	alcohol dependence syndrome	Single et al. 2003
296.2; 296.3	unipolar major depression	Rehm et al. 2006
Toxicity		
980	alcohol toxicity	Single et al. 2003
Diseases of the skin		
696 (excl. 696.0)	psoriasis	Konnopka & König 2009

Appendix 1b Overview of substance-attributable diseases: TOBACCO

ICD-9	disease/condition	source
Infectious diseases		
010-012	respiratory tuberculosis	Single et al. 2003
Respiratory diseases		
480-488	pneumonia and influenza	Single et al. 2003
490-492	COPD	Single et al. 2003
493	Asthma	Neubauer et al. 2006
Neoplasms		
140-149; 230.0	lip, oral cavity, and pharynx cancer	Single et al. 2003
150; 230.1	oesophageal cancer	Single et al. 2003
151; 230.2	malignant neoplasm of stomach	Single et al. 2003
157; 230.9	pancreatic cancer	Single et al. 2003
161; 231.0	laryngeal cancer	Single et al. 2003
162	trachea, bronchus, lung cancer	Single et al. 2003
180; 233.1	cervical cancer	Rehm et al. 2006
188	bladder cancer	Single et al. 2003
189	urinary tract cancer	Rehm et al. 2006
205	acute myeloid leukaemia	Rehm et al. 2006
Digestive system		
533	peptic ulcer	Single et al. 2003
556	ulcerative colitis	Single et al. 2003
Circulatory system		
390-398	rheumatic heart disease	Neubauer et al. 2006
401-405	hypertension	Neubauer et al. 2006
410-414	ischaemic heart disease	Single et al. 2003
415-417	pulmonary heart disease	Single et al. 2003
427	cardiac arrhythmia	Rehm et al. 2006
428	heart failure	Single et al. 2003
433-437	haemorrhagic stroke	Single et al. 2003
456	oesophageal varices	Single et al. 2003
440-449	atherosclerosis	Single et al. 2003
Perinatal diseases		
760.79	foetus &newborn affected by maternal tobacco use	Rehm et al. 2006
764-765	short gestation/low birthweight	Single et al. 2003
769	respiratory distress syndrome	Neubauer et al. 2006
770	congenital pneumonia	Neubauer et al. 2006
770.1	neonatal aspiration syndromes	Neubauer et al. 2006
770.2	interstitial emphysema	Neubauer et al. 2006
770.3	pulmonary haemorrhage	Neubauer et al. 2006
798	sudden infant death syndrome	Single et al. 2003
Nervous system diseases		
332	Parkinson disease	Single et al. 2003
Toxicity		
989.84	toxic effect of tobacco/nicotine	Rehm et al. 2006

Appendix 1c Overview of substance-attributable diseases: ILLICIT DRUGS

ICD-9	disease/condition	source
Mental disorders		
304.2	due to use of cocaine	Single et al. 2003
304.3	due to use of cannabinoids	Single et al. 2003
304.4	due to use of amphetamine & other stimulants	Single et al. 2003
304.5	due to use of hallucinogens	Single et al. 2003
304.7; 304.8	due to multiple drug use	Single et al. 2003
292	drug psychosis	Single et al. 2003
Injury and poisoning		
965	opium	Single et al. 2003
965.01	heroin	Single et al. 2003
965.02	methadone	Single et al. 2003
968.9	local anaesthetics (cocaine)	Single et al. 2003
969.9	cannabis	Single et al. 2003
970.81	cocaine	Single et al. 2003
Infectious diseases		
013-018	tuberculosis	Garcia-Altés et al. 2002
70	viral hepatitis	Single et al. 2003
042-044	HIV disease	Hansen et al. 2011
Circulatory system		
421	acute & subacute infective endocarditis	Single et al. 2003
Perinatal diseases		
760.72; 760.75	newborn drug toxicity	Single et al. 2003
762.0; 762.1; 765	opiate caused low birthweight	Single et al. 2003
641.0, 1 & 9; 655.53	pregnancy complications	Rehm et al. 2006

Appendix 1d Overview of substance-attributable diseases: PSYCHOACTIVE PHARMACEUTICALS

ICD-9	disease/condition	source
Mental disorders		
304	due to use of opioids	Single et al. 2003
304.1	due to use of sedatives or hypnotics	Single et al. 2003
Injury and poisoning		
965.09	other opioids	Single et al. 2003
967	by sedative-hypnotic drugs	Single et al. 2003
969	by psychotropic agents	Single et al. 2003

Appendix 2a Disease- and sex-specific relative risks: ALCOHOL

ICD-9	disease/condition	females			males			source
		cat. I	cat. II	cat. III	cat. I	cat. II	cat. III	
Neoplasms								
140-149; 230.0	lip, oral cavity, and pharynx cancer	1.45	1.85	5.39	1.45	1.85	5.39	Rehm et al. 2003a
150; 230.1	oesophageal cancer	1.80	2.38	4.36	1.80	2.38	4.36	Rehm et al. 2003a
154.1	rectal cancer	NA	1.11	1.33	1.08	1.30	1.72	Rehm et al. 2007
155	liver cancer	1.45	3.03	3.60	1.45	3.03	3.60	Rehm et al. 2003a
157; 230.9	pancreatic cancer	1.10	1.30	1.70	1.10	1.30	1.70	Rehm et al. 2003b
161; 231.0	laryngeal cancer	1.83	3.90	4.93	1.83	3.90	4.93	Rehm et al. 2003a
174	breast cancer							
	<45 years	1.15	1.41	1.46	NA	NA	NA	Rehm et al. 2003a
	≥45 years	1.14	1.38	1.62	NA	NA	NA	Rehm et al. 2003a
Nervous system								
331.7	degeneration of nervous system due to alcohol			100% attributable to alcohol use				Rehm et al. 2007
345	epilepsy	1.34	7.22	7.52	1.23	7.52	6.83	Rehm et al. 2003a
357.5	alcoholic polyneuropathy			100% attributable to alcohol use				Single et al. 2001
Circulatory system								
401-405	hypertension	1.40	2.00	2.00	1.40	2.00	4.10	Rehm et al. 2003a
410-414	ischaemic heart disease	0.82	0.83	1.12	0.82	0.83	1.00	Rehm et al. 2003b
425.5	alcoholic cardiomyopathy			100% attributable to alcohol use				Single et al. 2001
427	cardiac arrhythmia	1.51	2.23	2.23	1.51	2.23	2.23	Rehm et al. 2003a
428	heart failure	1.00	1.20	1.20	1.00	1.20	1.70	Klatsky et al. 2005
430-432	ischaemic stroke	0.52	0.64	1.06	0.94	1.33	1.65	Rehm et al. 2003b
433-437	haemorrhagic stroke	0.59	0.65	7.98	1.27	2.19	2.38	Rehm et al. 2003b
456	oesophageal varices	1.26	9.54	9.54	1.26	9.54	9.54	Rehm et al. 2003a
Metabolic diseases								
250	diabetes mellitus	0.92	0.87	1.13	1.00	0.57	0.73	Rehm et al. 2003b
Perinatal diseases								
760.71	foetal alcohol syndrome			100% attributable to alcohol use				Rehm et al. 2007
764-765	short gestation/low birthweight	1.00	1.40	1.40	1.00	1.40	1.40	Rehm et al. 2003a

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

Appendix 2a Disease- and sex-specific relative risks: ALCOHOL (continued)

ICD-9	disease/condition	females			males			source
		cat. I	cat. II	cat. III	cat. I	cat. II	cat. III	
Digestive system								
535.3	alcoholic gastritis			100% attributable to alcohol use				Single et al. 2001
571	alcoholic liver disease			100% attributable to alcohol use				Single et al. 2001
574	cholelithiasis	0.82	0.68	0.53	0.72	0.61	0.48	Rehm et al. 2007
577	acute pancreatitis	1.30	1.80	1.80	1.30	1.80	3.20	Rehm et al. 2003a
577.1	chronic pancreatitis (alcohol induced)	1.30	1.80	1.80	1.30	1.80	3.20	Rehm et al. 2003a
Mental disorders								
291	alcoholic psychosis			100% attributable to alcohol use				Single et al. 2001
305	alcohol abuse			100% attributable to alcohol use				Single et al. 2001
303	alcoholic dependence syndrome			100% attributable to alcohol use				Single et al. 2001
296.2-296.3	unipolar major depression	1.66	3.98	4.32	1.19	2.49	2.12	Gilman et al. 2001
Toxicity								
980	alcohol toxicity			100% attributable to alcohol use				Single et al. 2001
Diseases of the skin								
696 (excl. 696.0)	psoriasis	1.58	1.60	2.20	1.58	1.60	2.20	Rehm et al. 2003a

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

Appendix 2b Disease-, age- and sex-specific relative risks: TOBACCO -MALES

ICD-9	disease/condition	current					former				source
		0-5y	35-54y	55-64y	65-74y	≥75y	35-54y	55-64y	65-74y	≥75y	
Respiratory diseases											
010-012/480-488	respiratory tuberculosis				2.58	1.62			1.62	1.42	USDH 2014
490-492	COPD				29.69	23.01			8.13	6.55	USDH 2014
010-012/480-488/490-492/493	resp. tuberculosis/influenza/COPD		4.47	15.17			2.22	3.98			USDH 2014
Neoplasms											
162	trachea, bronchus, lung		14.33	19.03	28.29	22.51	4.40	4.57	7.79	6.46	USDH 2014
140-149; 230.0	lip, oral cavity, and pharynx cancer		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
150; 230.1	oesophageal cancer		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
151; 230.2	malignant neoplasm of stomach		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
157; 230.9	pancreatic cancer		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
161; 231.0	laryngeal cancer		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
188	bladder		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
189	urinary tract cancer		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
205	acute myeloid leukaemia		1.74	1.86	2.35	2.18	1.36	1.31	1.49	1.46	USDH 2014
Circulatory system											
390-398	rheumatic heart disease				2.22	1.66			1.32	1.15	USDH 2014
401-405	hypertension				2.22	1.66			1.32	1.15	USDH 2014
410-414	ischaemic heart disease		3.88	2.99	2.76	1.98	1.83	1.52	1.58	1.32	USDH 2014
415-417	pulmonary heart disease				2.22	1.66			1.32	1.15	USDH 2014
427	cardiac arrhythmias				2.22	1.66			1.32	1.15	USDH 2014
428	heart failure				2.22	1.66			1.32	1.15	USDH 2014
430-438	cerebrovascular disease				2.17	1.48			1.23	1.12	USDH 2014
440-449	atherosclerosis				7.25	4.93			2.20	1.72	USDH 2014
Toxicity											
989.84	toxic effect of tobacco/nicotine		1	1	1	1	1	1	1	1	Single et al. 2001
Perinatal diseases											
798	sudden infant death syndrome	1.50									Shultz et al. 1991

USDH, US Department of Health and Human Services

Appendix 2b Disease- and sex-specific relative risks: TOBACCO (continued) - FEMALES

ICD-9	disease/condition	current					former				source
		0-5y	35-54y	55-64y	65-74y	≥75y	35-54y	55-64y	65-74y	≥75y	
Respiratory diseases											
010-012/480-488	respiratory tuberculosis				1.75	2.06			1.28	1.21	USDH 2014
490-492	COPD				38.89	20.96			15.72	7.06	USDH 2014
010-012/480-488/490-492/493	resp. tuberculosis/influenza/COPD		6.43	9.00			1.85	4.84			USDH 2014
Neoplasms											
162	trachea, bronchus, lung		13.30	18.95	23.65	23.08	2.64	5.00	6.80	6.38	USDH 2014
140-149; 230.0	lip, oral cavity, and pharynx cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
150; 230.1	oesophageal cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
151; 230.2	malignant neoplasm of stomach		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
157; 230.9	pancreatic cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
161; 231.0	laryngeal cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
180; 233.1	cervical cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
188	bladder		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
189	urinary tract cancer		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
205	acute myeloid leukaemia		1.28	2.08	2.06	1.93	1.24	1.28	1.26	1.27	USDH 2014
Circulatory system											
390-398	rheumatic heart disease				1.85	1.75			1.29	1.32	USDH 2014
401-405	hypertension				1.85	1.75			1.29	1.32	USDH 2014
410-414	ischaemic heart disease		4.98	3.25	3.29	2.25	2.23	1.21	1.56	1.42	USDH 2014
415-417	pulmonary heart disease				1.85	1.75			1.29	1.32	USDH 2014
427	cardiac arrhythmias				1.85	1.75			1.29	1.32	USDH 2014
428	heart failure				1.85	1.75			1.29	1.32	USDH 2014
430-438	cerebrovascular disease				2.27	1.70			1.24	1.10	USDH 2014
440-449	atherosclerosis				6.81	5.77			2.26	2.02	USDH 2014
Toxicity											
989.84	toxic effect of tobacco/nicotine		1	1	1	1	1	1	1	1	Single et al. 2001
Perinatal diseases											
798	sudden infant death syndrome	1.50									Shultz et al. 1991

USDH, US Department of Health and Human Services

Appendix 2c Disease-specific relative risks: ILLICIT DRUGS

ICD-9	disease/condition	relative risk	source
Mental disorders			
304.3	due to use of cannabinoids	100% attributable to illicit drug use	Single et al. 2001
304.2	due to use of cocaine	100% attributable to illicit drug use	Single et al. 2001
304.4	due to use of amphetamine and other stimulants	100% attributable to illicit drug use	Single et al. 2001
304.5	due to use of hallucinogens	100% attributable to illicit drug use	Single et al. 2001
304.7; 304.8	due to multiple drug use	100% attributable to illicit drug use	Single et al. 2001
292	drug psychosis	100% attributable to illicit drug use	Single et al. 2001
Infectious diseases			
010-018	tuberculosis	2.23	Han et al. 2010
70	viral hepatitis		
042-044	HIV disease	1.54	MacArthur et al. 2012
Perinatal diseases			
760.72; 760.75	newborn drug toxicity	100% attributable to illicit drug use	Single et al. 2001
762.0; 762.1; 764; 765	opiate caused low birthweight	3.34	Ridolfo & Stevenson 2001
Poisonings			
965.00	opium	100% attributable to illicit drug use	Single et al. 2001
965.01	heroin	100% attributable to illicit drug use	Single et al. 2001
965.02	methadone	100% attributable to illicit drug use	Single et al. 2001
965.09	other synthetic narcotics	100% attributable to illicit drug use	Single et al. 2001
970.81	cocaine	100% attributable to illicit drug use	Single et al. 2001
969.9	cannabis	100% attributable to illicit drug use	Single et al. 2001
968.9	local anaesthetics (cocaine)	100% attributable to illicit drug use	Single et al. 2001

Appendix 2d Disease-specific relative risks: PSYCHOACTIVE PHARMACEUTICALS

ICD-9	disease/condition	relative risk	source
Mental disorders			
304.0	due to use of opioids	100% attributable to psychoactive pharmaceuticals use	Single et al. 2001
304.1	due to use of sedatives/hypnotics	100% attributable to psychoactive pharmaceuticals use	Single et al. 2001
Injury and poisoning			
969	by psychotropic agents	100% attributable to psychoactive pharmaceuticals use	Single et al. 2001
967	by sedative-hypnotic drugs	100% attributable to psychoactive pharmaceuticals use	Single et al. 2001
965.09	other opioids	100% attributable to psychoactive pharmaceuticals use	Single et al. 2001

Appendix 3a Age- and sex-specific alcohol-attributable fractions

ICD-9	disease/condition	age-band (years)	females				males			
			cat. I	cat. II	cat. III	total	cat. I	cat. II	cat. III	total
140-149; 230.0	lip, oral cavity, pharynx cancer	6-19	0.25	0.01	0.02	0.28	0.23	0.01	0.04	0.28
		20-39	0.25	0.01	0.02	0.27	0.26	0.01	0.04	0.31
		40-59	0.23	0.03	0.05	0.32	0.24	0.01	0.10	0.35
		60-79	0.23	0.02	0.03	0.28	0.23	0.02	0.12	0.36
		≥80[2]	0.18	0.02	0.02	0.21	0.23	0.00	0.03	0.26
150; 230.1	oesophageal cancer	6-19	0.37	0.02	0.01	0.39	0.35	0.01	0.03	0.39
		20-39	0.37	0.01	0.01	0.39	0.39	0.01	0.03	0.42
		40-59	0.35	0.04	0.03	0.43	0.36	0.02	0.06	0.45
		60-79	0.34	0.03	0.02	0.40	0.35	0.03	0.08	0.45
		≥80[2]	0.27	0.02	0.01	0.31	0.35	0.01	0.02	0.37
154.1	rectal cancer	6-19		0.00	0.00	0.00	0.05	0.00	0.01	0.07
		20-39		0.00	0.00	0.00	0.06	0.00	0.01	0.07
		40-59		0.01	0.01	0.01	0.06	0.01	0.02	0.09
		60-79		0.00	0.00	0.01	0.06	0.01	0.03	0.09
		≥80[2]		0.00	0.00	0.00	0.05	0.00	0.01	0.06
155	liver cancer	6-19	0.24	0.03	0.01	0.28	0.23	0.02	0.03	0.28
		20-39	0.25	0.02	0.01	0.28	0.26	0.02	0.02	0.31
		40-59	0.23	0.07	0.03	0.33	0.24	0.04	0.06	0.35
		60-79	0.22	0.06	0.02	0.30	0.23	0.05	0.07	0.35
		≥80[2]	0.17	0.04	0.01	0.22	0.23	0.01	0.02	0.26
157; 230.9	pancreas cancer	6-19	0.07	0.00	0.00	0.08	0.07	0.00	0.01	0.08
		20-39	0.07	0.00	0.00	0.08	0.08	0.00	0.01	0.09
		40-59	0.07	0.01	0.01	0.10	0.07	0.01	0.02	0.10
		60-79	0.07	0.01	0.01	0.08	0.07	0.01	0.03	0.11
		≥80[2]	0.05	0.01	0.00	0.06	0.06	0.00	0.01	0.07

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

RR abstainers=1.00

Appendix 3a Age- and sex-specific alcohol-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females				males			
			cat. I	cat. II	cat. III	total	cat. I	cat. II	cat. III	total
161; 231.0	laryngeal cancer	6-19	0.37	0.03	0.01	0.41	0.35	0.02	0.03	0.40
		20-39	0.37	0.03	0.01	0.41	0.39	0.02	0.03	0.44
		40-59	0.34	0.09	0.04	0.46	0.36	0.05	0.07	0.48
		60-79	0.34	0.07	0.02	0.43	0.34	0.05	0.09	0.48
		≥80[2]	0.27	0.05	0.02	0.34	0.36	0.01	0.02	0.39
174	breast cancer	6-19	0.10	0.01	0.00	0.11	NA	NA	NA	0.00
		20-39	0.10	0.01	0.00	0.11	NA	NA	NA	0.00
		40-59	0.09	0.02	0.01	0.12	NA	NA	NA	0.00
		60-79	0.09	0.01	0.01	0.11	NA	NA	NA	0.00
		≥80[2]	0.06	0.01	0.00	0.08	NA	NA	NA	0.00
345	epilepsy	6-19	0.18	0.08	0.03	0.29	0.12	0.06	0.06	0.24
		20-39	0.19	0.07	0.02	0.28	0.14	0.06	0.06	0.26
		40-59	0.15	0.20	0.07	0.42	0.12	0.13	0.13	0.38
		60-79	0.16	0.16	0.04	0.36	0.11	0.14	0.15	0.40
		≥80[2]	0.12	0.11	0.03	0.26	0.13	0.04	0.04	0.20
401-405	hypertensive disease	6-19	0.23	0.01	0.00	0.25	0.21	0.01	0.03	0.25
		20-39	0.23	0.01	0.00	0.24	0.24	0.01	0.03	0.28
		40-59	0.22	0.04	0.01	0.27	0.22	0.02	0.07	0.32
		60-79	0.21	0.03	0.01	0.25	0.21	0.02	0.09	0.33
		≥80[2]	0.16	0.02	0.00	0.19	0.21	0.01	0.02	0.24
410-414	ischaemic heart disease	6-19	-0.16	0.00	0.00	-0.16	-0.15	0.00	0.00	-0.15
		20-39	-0.16	0.00	0.00	-0.16	-0.18	0.00	0.00	-0.18
		40-59	-0.16	-0.01	0.00	-0.17	-0.18	-0.01	0.00	-0.18
		60-79	-0.15	-0.01	0.00	-0.15	-0.17	-0.01	0.00	-0.18
		≥80[2]	-0.10	0.00	0.00	-0.10	-0.14	0.00	0.00	-0.15

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

RR abstainers=1.00

Appendix 3a Age- and sex-specific alcohol-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females				males			
			cat. I	cat. II	cat. III	total	cat. I	cat. II	cat. III	total
427	cardiac dysrhythmia	6-19	0.27	0.02	0.01	0.29	0.26	0.01	0.01	0.28
		20-39	0.27	0.01	0.00	0.29	0.29	0.01	0.01	0.32
		40-59	0.26	0.05	0.02	0.32	0.28	0.03	0.03	0.34
		60-79	0.25	0.03	0.01	0.30	0.27	0.03	0.03	0.33
		≥80[2]	0.20	0.02	0.01	0.22	0.26	0.01	0.01	0.27
430-432	ischaemic stroke	6-19	-0.57	-0.01	0.00	-0.58	-0.04	0.00	0.01	-0.03
		20-39	-0.57	-0.01	0.00	-0.58	-0.05	0.00	0.01	-0.04
		40-59	-0.59	-0.03	0.00	-0.62	-0.05	0.01	0.02	-0.02
		60-79	-0.53	-0.02	0.00	-0.55	-0.05	0.01	0.03	-0.01
		≥80[2]	-0.32	-0.01	0.00	-0.33	-0.04	0.00	0.01	-0.04
433-437	haemorrhagic stroke	6-19	-0.43	-0.01	0.06	-0.38	0.16	0.01	0.02	0.18
		20-39	-0.43	-0.01	0.05	-0.39	0.18	0.01	0.01	0.21
		40-59	-0.39	-0.02	0.16	-0.26	0.17	0.03	0.04	0.24
		60-79	-0.38	-0.02	0.09	-0.30	0.16	0.03	0.04	0.24
		≥80[2]	-0.24	-0.01	0.05	-0.20	0.16	0.01	0.01	0.17
456	oesophageal varices	6-19	0.14	0.11	0.11	0.36	0.13	0.08	0.08	0.29
		20-39	0.14	0.09	0.09	0.33	0.15	0.07	0.08	0.31
		40-59	0.11	0.26	0.26	0.62	0.12	0.16	0.17	0.44
		60-79	0.11	0.21	0.21	0.54	0.11	0.16	0.19	0.47
		≥80[2]	0.09	0.15	0.15	0.39	0.14	0.05	0.05	0.24
574	cholelithiasis	6-19	-0.16	-0.01	0.00	-0.17	-0.25	-0.01	-0.01	-0.27
		20-39	-0.16	-0.01	0.00	-0.17	-0.31	-0.01	-0.01	-0.33
		40-59	-0.16	-0.02	-0.01	-0.19	-0.31	-0.02	-0.02	-0.36
		60-79	-0.15	-0.01	-0.01	-0.17	-0.30	-0.02	-0.03	-0.35
		≥80[2]	-0.10	-0.01	0.00	-0.11	-0.25	0.00	-0.01	-0.25

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

RR abstainers=1.00

Appendix 3a Age- and sex-specific alcohol-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females				males			
			cat. I	cat. II	cat. III	total	cat. I	cat. II	cat. III	total
577	acute pancraetitis	6-19	0.18	0.01	0.00	0.20	0.17	0.01	0.02	0.20
		20-39	0.18	0.01	0.00	0.20	0.20	0.01	0.02	0.23
		40-59	0.18	0.03	0.01	0.22	0.18	0.02	0.06	0.26
		60-79	0.17	0.03	0.01	0.20	0.18	0.02	0.07	0.26
		≥80[2]	0.13	0.02	0.00	0.15	0.17	0.00	0.01	0.19
577.1	chronic pancreatitis	6-19	0.18	0.01	0.00	0.20	0.17	0.01	0.02	0.20
		20-39	0.18	0.01	0.00	0.20	0.20	0.01	0.02	0.23
		40-59	0.18	0.03	0.01	0.22	0.18	0.02	0.06	0.26
		60-79	0.17	0.03	0.01	0.20	0.18	0.02	0.07	0.26
		≥80[2]	0.13	0.02	0.00	0.15	0.17	0.00	0.01	0.19
696 (excl. 696.0)	psoriasis	6-19	0.30	0.01	0.00	0.31	0.29	0.01	0.01	0.30
		20-39	0.30	0.01	0.00	0.31	0.32	0.01	0.01	0.34
		40-59	0.30	0.02	0.01	0.33	0.31	0.02	0.03	0.36
		60-79	0.28	0.02	0.01	0.31	0.30	0.02	0.03	0.35
		≥80[2]	0.22	0.01	0.01	0.24	0.29	0.00	0.01	0.30
250	diabetes mellitus	6-19	-0.06	0.00	0.00	-0.07	0.00	-0.01	0.00	-0.01
		20-39	-0.06	0.00	0.00	-0.07	0.00	-0.01	0.00	-0.01
		40-59	-0.07	-0.01	0.00	-0.07	0.00	-0.01	-0.01	-0.02
		60-79	-0.06	-0.01	0.00	-0.06	0.00	-0.02	-0.01	-0.03
		≥80[2]	-0.04	0.00	0.00	-0.04	0.00	0.00	0.00	-0.01

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

RR abstainers=1.00

Appendix 3a Age- and sex-specific alcohol-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females				males			
			cat. I	cat. II	cat. III	total	cat. I	cat. II	cat. III	total
764-765	short gestation/low birthweight	6-19	0.00	0.01	0.00	0.01	0.00	0.00	0.01	0.01
428	heart failure	6-19	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
		20-39	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
		40-59	0.00	0.01	0.00	0.01	0.00	0.01	0.02	0.03
		60-79	0.00	0.01	0.00	0.01	0.00	0.01	0.03	0.04
		≥80[2]	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01
296.2-296.3	unipolar major depression	6-19	0.32	0.03	0.01	0.36	0.12	0.02	0.01	0.14
		20-39	0.32	0.03	0.01	0.36	0.13	0.02	0.01	0.16
		40-59	0.29	0.09	0.03	0.42	0.13	0.04	0.03	0.20
		60-79	0.29	0.07	0.02	0.38	0.12	0.04	0.04	0.20
		≥80[2]	0.23	0.05	0.01	0.30	0.12	0.01	0.01	0.13

cat. I: males, 0-39.99 g/day; females, 0-19.99 g/day; cat. II: males, 40-59.99 g/day; females, 20-39.99 g/day; cat. III: males, ≥60 g/day; females, ≥40 g/day

RR abstainers=1.00

Appendix 3b Age- and sex-specific tobacco-attributable fractions

ICD-9	disease/condition	age-band (years)	females			males		
			current	former	Total	current	former	Total
010-012/480-488	respiratory tuberculosis	65-74	0.09	0.04	0.13	0.18	0.20	0.38
		≥75	0.02	0.02	0.05	0.06	0.13	0.19
490-492	COPD	65-74	0.60	0.29	0.88	0.53	0.37	0.90
		≥75	0.23	0.30	0.53	0.44	0.38	0.82
010-012/480-488/490-492/493	respiratory tuberculosis/pneumonia & influenza/COPD	35-54	0.54	0.06	0.60	0.45	0.12	0.57
		55-64	0.50	0.25	0.75	0.64	0.19	0.83
162	trachea, bronchus, lung cancer	35-54	0.71	0.06	0.77	0.70	0.17	0.87
		55-64	0.69	0.16	0.85	0.67	0.19	0.86
		65-74	0.61	0.19	0.80	0.52	0.37	0.90
		≥75	0.25	0.27	0.52	0.40	0.38	0.79
140-149; 230.0	lip, oral cavity, and pharynx cancer	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.17	0.17	0.34
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
150; 230.1	oesophageal cancer	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
151; 230.2	malignant neoplasm of stomach	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23

Appendix 3b Age- and sex-specific tobacco-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females			males		
			current	former	Total	current	former	Total
157; 230.9	pancreatic cancer	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
161; 231.0	laryngeal cancer	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.11	0.04	0.15	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
180; 233.1	cervical cancer	35-54	0.06	0.04	0.10			
		55-64	0.20	0.06	0.26			
		65-74	0.12	0.04	0.16			
		≥75	0.02	0.03	0.05			
188	bladder	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
189	urinary tract cancer	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23
205	acute myeloid leukaemia	35-54	0.06	0.04	0.10	0.17	0.06	0.24
		55-64	0.20	0.06	0.26	0.17	0.09	0.26
		65-74	0.12	0.04	0.16	0.16	0.17	0.33
		≥75	0.02	0.03	0.05	0.10	0.14	0.23

Appendix 3b Age- and sex-specific tobacco-attributable fractions (continued)

ICD-9	disease/condition	age-band (years)	females			males		
			current	former	Total	current	former	Total
390-398	rheumatic heart disease	65-74	0.10	0.04	0.14	0.16	0.12	0.28
		≥75	0.02	0.03	0.05	0.06	0.05	0.12
401-405	hypertension	65-74	0.10	0.04	0.14	0.16	0.12	0.28
		≥75	0.02	0.03	0.05	0.06	0.05	0.12
410-414	ischaemic heart disease	35-54	0.45	0.09	0.54	0.43	0.09	0.52
		55-64	0.35	0.03	0.38	0.31	0.12	0.42
		65-74	0.22	0.07	0.29	0.20	0.19	0.38
		≥75	0.03	0.04	0.07	0.09	0.10	0.19
415-417	pulmonary heart disease	65-74	0.10	0.04	0.14	0.16	0.12	0.28
		≥75	0.02	0.03	0.05	0.06	0.05	0.12
427	cardiac arrhythmias	65-74	0.10	0.04	0.14	0.16	0.12	0.28
		≥75	0.02	0.03	0.05	0.06	0.05	0.12
428	heart failure	65-74	0.10	0.04	0.14	0.16	0.12	0.28
		≥75	0.02	0.03	0.05	0.06	0.05	0.12
430-438	cerebrovascular disease	65-74	0.14	0.03	0.18	0.16	0.09	0.25
		≥75	0.02	0.01	0.03	0.05	0.04	0.09
440-449	atherosclerosis	65-74	0.39	0.11	0.50	0.41	0.23	0.64
		≥75	0.09	0.09	0.18	0.25	0.16	0.41
	toxic effect of nicotine	all ages			1.00			1.00
798	sudden infant death syndrome	0-5	0.09			0.14		

Appendix 3c Age- and sex-specific drug-attributable fractions

ICD-9	disease/condition	age-band (years)	males	females
042-044	HIV disease	**6-19**	0.04	0.07
		20-39	0.08	0.03
		40-59	0.01	0.00
		60-79	0.00	0.00
		≥80	0.00	0.00
421	acute & subacute infective endocarditis		0.14	0.14
70	viral hepatitis		0.42	0.42
010-018	tuberculosis		0.10	0.10

Appendix 4a Age-, sex- and disease-specific hospital inpatient care episodes: ALCOHOL

disease/condition	age-band (years)	total	males	females
acute pancreatitis	**0-5**	9	6	3
	6-19	118	77	41
	20-39	1281	840	441
	40-59	3231	2119	1112
	60-79	1771	1162	609
	≥80	629	413	216
alcohol abuse	**0-5**	5	3	2
	6-19	390	234	156
	20-39	772	462	310
	40-59	1114	667	447
	60-79	663	397	266
	≥80	182	109	73
alcoholic cardiomyopaty	**20-39**	<5	2	0
	40-59	44	35	9
	60-79	31	25	6
	≥80	<5	2	0
alcoholic dependence syndrome	**6-19**	65	43	22
	20-39	1290	846	444
	40-59	4322	2836	1486
	60-79	1628	1068	560
	≥80	129	85	44
alcoholic gastritis	**6-19**	<5	2	0
	20-39	8	6	2
	40-59	15	12	3
	60-79	<5	2	0
alcoholic liver disease	**0-5**	18	11	7
	6-19	38	24	14
	20-39	288	182	106
	40-59	2408	1522	886
	60-79	2081	1315	766
	≥80	250	158	92
alcoholic polyneuropathy	**20-39**	7	5	2
	40-59	73	53	20
	60-79	75	54	21
	≥80	8	6	2
alcoholic psychosis	**6-19**	<5	1	1
	20-39	251	188	63
	40-59	1097	820	277
	60-79	615	460	155
	≥80	69	52	17

base case analysis: <5=2

Appendix 4a Age-, sex- and disease-specific hospital inpatient care episodes: ALCOHOL (continued)

disease/condition	age-band (years)	total	males	females
breast cancer	**6-19**	<5	0	2
	20-39	569	0	569
	40-59	5080	0	5080
	60-79	5518	0	5518
	≥80	1413	0	1413
cardiac arrhythmias	**0-5**	113	61	52
	6-19	351	189	162
	20-39	1421	767	654
	40-59	6356	3431	2925
	60-79	16219	8756	7463
	≥80	8955	4835	4120
cholelithiasis	**0-5**	12	4	8
	6-19	304	103	201
	20-39	4786	1625	3161
	40-59	8188	2780	5408
	60-79	8207	2787	5420
	≥80	3547	1204	2343
degeneration of nervous system due to alcohol	**60-79**	<5	1	1
	≥80	<5	1	1
diabetes mellitus	**0-5**	110	59	51
	6-19	1061	571	490
	20-39	1678	903	775
	40-59	4882	2627	2255
	60-79	8198	4412	3786
	≥80	3299	1775	1524
foetal alcohol syndrome	**j0_5**	<5	0	2
haemorrhagic stroke	**0-5**	20	10	10
	6-19	40	20	20
	20-39	505	252	253
	40-59	4156	2072	2084
	60-79	14025	6991	7034
	≥80	11946	5955	5991
heart failure	**0-5**	21	10	11
	6-19	20	10	10
	20-39	157	78	79
	40-59	1554	776	778
	60-79	8859	4427	4432
	≥80	12492	6242	6250
hypertension	**0-5**	9	4	5
	6-19	41	17	24
	20-39	245	104	141
	40-59	1199	507	692
	60-79	3032	1283	1749
	≥80	2480	1049	1431

base case analysis: <5=2

Appendix 4a Age-, sex- and disease-specific hospital inpatient care episodes: ALCOHOL (continued)

disease/condition	age-band (years)	total	males	females
ischaemic heart disease	**0-5**	<5	1	1
	6-19	10	7	3
	20-39	561	384	177
	40-59	14702	10067	4635
	60-79	34371	23536	10835
	≥80	11045	7563	3482
ischaemic stroke	**0-5**	25	13	12
	6-19	24	12	12
	20-39	184	93	91
	40-59	944	477	467
	60-79	1929	976	953
	≥80	1701	860	841
laryngeal cancer	**6-19**	<5	2	0
	20-39	8	7	1
	40-59	233	197	36
	60-79	411	347	64
	≥80	82	69	13
lip, oral cavity and pharynx cancer	**0-5**	<5	1	1
	6-19	<5	1	1
	20-39	65	47	18
	40-59	1061	772	289
	60-79	1269	923	346
	≥80	191	139	52
liver cancer	**0-5**	18	12	6
	6-19	8	5	3
	20-39	31	21	10
	40-59	351	234	117
	60-79	1067	713	354
	≥80	316	211	105
oesophageal cancer	**20-39**	6	4	2
	40-59	385	284	101
	60-79	836	617	219
	≥80	213	157	56
oesophageal varices	**0-5**	<5	1	1
	6-19	56	40	16
	20-39	64	46	18
	40-59	111	79	32
	60-79	110	79	31
	≥80	20	14	6
pancreatic cancer	**6-19**	<5	1	1
	20-39	15	8	7
	40-59	444	222	222
	60-79	1491	746	745
	≥80	738	369	369

base case analysis: <5=2

Appendix 4a Age-, sex- and disease-specific hospital inpatient care episodes: ALCOHOL (continued)

disease/condition	age-band (years)	total	males	females
psoriasis	**0-5**	<5	1	1
	6-19	<5	1	1
	20-39	23	14	9
	40-59	62	38	24
	60-79	46	28	18
	≥80	14	8	6
rectal cancer	**20-39**	36	21	15
	40-59	582	347	235
	60-79	1702	1016	686
	≥80	638	381	257
unipolar major depression	**6-19**	50	15	35
	20-39	427	125	302
	40-59	959	281	678
	60-79	779	229	550
	≥80	388	114	274
epilepsy	**0-5**	1280	708	572
	6-19	2432	1346	1086
	20-39	2681	1484	1197
	40-59	3707	2052	1655
	60-79	2684	1486	1198
	≥80	1158	641	517

base case analysis: <5=2

Appendix 4b Age-, sex- and disease-specific hospital inpatient care episodes: TOBACCO

disease/condition	age-band (years)	total	males	females
COPD	**0-5**	731	446	285
	6-19	107	65	42
	20-39	311	190	121
	40-59	4708	2870	1838
	60-79	14457	8812	5645
	65-74	7229	4406	2823
	≥75	10516	6410	4106
	≥80	6902	4207	2695
acute myeloid leukemia	**0-5**	10	5	5
	6-19	32	17	15
	20-39	92	48	44
	40-59	270	142	128
	60-79	478	252	226
	35-54	226	119	107
	55-64	187	98	89
	65-74	239	126	113
	≥75	484	255	229
	≥80	245	129	116
malignant neoplasm of stomach	**20-39**	37	25	12
	40-59	430	286	144
	60-79	1084	721	363
	35-54	332	221	111
	55-64	379	252	127
	65-74	542	361	181
	≥75	833	554	279
	≥80	562	374	188
asthma	**0-5**	1993	964	1029
	6-19	985	477	508
	20-39	779	377	402
	40-59	967	468	499
	60-79	960	465	495
	≥80	495	240	255
atherosclerosis	**0-5**	111	74	37
	6-19	111	74	37
	20-39	321	214	107
	40-59	5055	3366	1689
	60-79	14714	9796	4918
	65-74	7357	4898	2459
	≥75	9548	6357	3191
	≥80	5869	3908	1961

base case analysis: <5=2

Appendix 4b Age-, sex- and disease-specific hospital inpatient care episodes: TOBACCO (continued)

disease/condition	age-band (years)	total	males	females
bladder cancer	**0-5**	<5	2	0
	6-19	<5	2	0
	20-39	21	17	4
	40-59	747	597	150
	60-79	3827	3058	769
	35-54	566	452	114
	55-64	1144	914	230
	65-74	1914	1529	384
	≥75	2957	2363	594
	≥80	2000	1598	402
cardiac arrhythmias	**0-5**	113	61	52
	6-19	351	189	162
	20-39	1421	767	654
	40-59	6356	3431	2925
	60-79	16219	8756	7463
	65-74	8110	4378	3731
	≥75	13010	7024	5986
	≥80	8955	4835	4120
cervical cancer	**0-5**	<5		2
	6-19	<5		2
	20-39	331		331
	40-59	722		722
	60-79	293		293
	35-54	624		624
	55-64	254		254
	65-74	147		147
	≥75	180		180
	≥80	107		107
cerebro vascular disease	**0-5**	45	22	23
	6-19	64	32	32
	20-39	689	343	346
	40-59	5100	2542	2558
	60-79	15954	7953	8001
	65-74	7977	3976	4001
	≥75	17636	8791	8845
	≥80	13647	6803	6844
heart failure	**0-5**	21	10	11
	6-19	20	10	10
	20-39	157	78	79
	40-59	1554	776	778
	60-79	8859	4427	4432
	65-74	4430	2213	2216
	≥75	14707	7349	7358
	≥80	12492	6242	6250

base case analysis: <5=2

Appendix 4b Age-, sex- and disease-specific hospital inpatient care episodes: TOBACCO (continued)

disease/condition	age-band (years)	total	males	females
hypertension	**0-5**	9	4	5
	6-19	41	17	24
	20-39	245	104	141
	40-59	1199	507	692
	60-79	3032	1283	1749
	65-74	1516	641	875
	≥75	3238	1370	1868
	≥80	2480	1049	1431
ischaemic heart disease	**0-5**	<5	1	1
	6-19	10	7	3
	20-39	561	384	177
	40-59	14702	10067	4635
	60-79	34371	23536	10835
	35-54	11167	7647	3520
	55-64	12268	8401	3867
	65-74	17186	11768	5418
	≥75	19638	13447	6191
	≥80	11045	7563	3482
laryngeal cancer	**6-19**	<5	2	0
	20-39	8	7	1
	40-59	233	197	36
	60-79	411	347	64
	35-54	177	149	27
	55-64	161	136	25
	65-74	206	174	32
	≥75	185	156	29
	≥80	82	69	13
lip, oral cavity and pharynx cancer	**0-5**	<5	1	1
	6-19	<5	1	1
	20-39	65	47	18
	40-59	1061	772	289
	60-79	1269	923	346
	35-54	812	591	221
	55-64	583	424	159
	65-74	635	462	173
	≥75	508	370	138
	≥80	191	139	52
peptic ulcer	**20-39**	5	3	2
	40-59	19	10	9
	60-79	19	10	9
	≥80	22	11	11
congenital pneumonia	**0-5**	717	398	319
foetus & newborn affected by maternal tobacco use	**0-5**	<5	1	1
toxic effect of nicotine	**0-5**	7	5	2

base case analysis: <5=2

Appendix 4b Age-, sex- and disease-specific hospital inpatient care episodes: TOBACCO (continued)

disease/condition	age-band (years)	total	males	females
pancreatic cancer	**6-19**	<5	1	1
	20-39	15	8	7
	40-59	444	222	222
	60-79	1491	746	745
	35-54	337	169	168
	55-64	484	242	242
	65-74	746	373	372
	≥75	1111	556	555
	≥80	738	369	369
Parkinson disease	**6-19**	<5	1	1
	20-39	11	6	5
	40-59	204	103	101
	60-79	1404	711	693
	≥80	967	490	477
pneumonia & influenza	**0-5**	10373	5681	4692
	6-19	2747	1504	1243
	20-39	2864	1568	1296
	40-59	5095	2790	2305
	60-79	10899	5969	4930
	≥80	11156	6109	5047
pulmonary heart disease	**0-5**	8	3	5
	6-19	42	18	24
	20-39	437	184	253
	40-59	1290	542	748
	60-79	2674	1123	1551
	65-74	1337	562	775
	≥75	2419	1016	1403
	≥80	1750	735	1015
respiratory tuberculosis	**0-5**	45	29	16
	6-19	62	40	22
	20-39	285	184	101
	40-59	190	123	67
	60-79	125	81	44
	65-74	63	40	22
	≥75	79	51	28
	≥80	48	31	17
tuberculosis	**0-5**	9	5	4
	6-19	10	6	4
	20-39	90	51	39
	40-59	46	26	20
	60-79	30	17	13
	≥80	22	13	9
sudden infant death syndrome	**0-5**	18	12	6

base case analysis: <5=2

Appendix 4b Age-, sex- and disease-specific hospital inpatient care episodes: TOBACCO (continued)

disease/condition	age-band (years)	total	males	females
rheumatic heart disease	**0-5**	6	2	4
	6-19	9	3	6
	20-39	25	7	18
	40-59	91	25	66
	60-79	262	73	189
	65-74	131	37	94
	≥75	142	40	102
	≥80	76	21	55
trachea, bronchus & lung cancer	**0-5**	2	1	1
	6-19	2	1	1
	20-39	54	38	16
	40-59	2362	1642	720
	60-79	6519	4531	1988
	35-54	1785	1241	544
	55-64	2220	1543	677
	65-74	3260	2265	994
	≥75	3272	2274	998
	≥80	1642	1141	501
respiratory distress syndrome	**0-5**	236	160	76
ulcerative colitis	**0-5**	9	4	5
	6-19	99	48	51
	20-39	326	158	168
	40-59	281	136	145
	60-79	271	131	140
	≥80	167	81	86
urinary tract cancer	**0-5**	40	25	15
	6-19	20	13	7
	20-39	54	34	20
	40-59	567	356	211
	60-79	1443	906	537
	35-54	439	275	163
	55-64	503	315	187
	65-74	722	453	269
	≥75	848	532	316
	≥80	487	306	181
oesophageal cancer	**20-39**	6	4	2
	40-59	385	284	101
	60-79	836	617	219
	35-54	290	214	76
	55-64	305	225	80
	65-74	418	308	110
	≥75	422	311	111
	≥80	213	157	56

base case analysis: <5=2

Appendix 4c Age-, sex- and disease-specific hospital inpatient care episodes: ILLICIT DRUGS

disease/condition	age-band (years)	total	males	females
HIV disease	**0-5**	<5	1	1
	6-19	9	6	3
	20-39	244	155	89
	40-59	400	254	146
	60-79	69	44	25
	≥80	<5	1	1
acute & subacute infective endocarditis	**0-5**	<5	1	1
	6-19	6	4	2
	20-39	21	14	7
	40-59	101	67	34
	60-79	154	102	52
	≥80	68	45	23
poisoning by cocaine	**6-19**	<5	1	1
	20-39	57	36	21
	40-59	12	8	4
drug psychosis	**0-5**	6	2	4
	6-19	16	7	9
	20-39	191	78	113
	40-59	241	98	143
	60-79	305	125	180
	≥80	264	108	156
mental disorder due to multiple drug use	**6-19**	<5	1	1
	20-39	17	10	7
	40-59	13	8	5
	60-79	<5	1	1
	≥80	<5	1	1
mental disorder due to amphetamine use	**6-19**	<5	1	1
	20-39	18	11	7
	40-59	9	6	3
	60-79	<5	1	1
mental disorder due to use of cannabinoids	**6-19**	12	9	3
	20-39	46	36	10
	40-59	7	5	2
mental disorder to use of cocaine	**0-5**	<5	2	0
	6-19	<5	2	0
	20-39	62	47	15
	40-59	12	9	3
poisoning due to heroin	**20-39**	24	17	7
	40-59	9	7	2
poisoning due to local anaesthetics (cocaine)	**0-5**	<5	2	0

base case analysis: <5=2

Appendix 4c Age-, sex- and disease-specific hospital inpatient care episodes: ILLICIT DRUGS (continued)

disease/condition	age-band (years)	total	males	females
poisoning due to methadone use	**0-5**	8	6	2
	6-19	<5	1	1
	20-39	91	67	24
	40-59	65	48	17
	60-79	<5	1	1
	≥80	<5	1	1
newborn drug toxicity	**0-5**	<5	2	0
poisoning due to opium	**0-5**	5	3	2
	6-19	15	8	7
	20-39	34	19	15
	40-59	41	23	18
	60-79	13	7	6
	≥80	12	7	5
pregnancy complications	**6-19**	11	0	11
	20-39	1459	0	1459
	40-59	86	0	86
tuberculosis	**0-5**	9	5	4
	6-19	10	6	4
	20-39	90	51	39
	40-59	46	26	20
	60-79	30	17	13
	≥80	22	13	9
viral hepatitis	**0-5**	16	9	7
	6-19	36	21	15
	20-39	197	114	83
	40-59	292	169	123
	60-79	178	103	75
	≥80	28	16	12

base case analysis: <5=2

Appendix 4d Age-, sex- and disease-specific hospital inpatient care episodes: PSYCHOACTIVE PHARMACEUTICALS

disease/condition	age-band (years)	total	males	females
poisoning by psychotropic agents	**0-5**	165	57	108
	6-19	523	180	343
	20-39	1994	687	1307
	40-59	2389	823	1566
	60-79	665	229	436
	≥80	259	89	170
poisoning by sedative-hypnotic drugs	**0-5**	24	7	17
	6-19	59	18	41
	20-39	145	44	101
	40-59	237	72	165
	60-79	93	28	65
	≥80	47	14	33
mental disorder due to use of opioids	**0-5**	<5	1	1
	6-19	<5	1	1
	20-39	107	74	33
	40-59	68	47	21
	60-79	21	15	6
	≥80	<5	1	1
poisoning due to other opioids	**0-5**	14	5	9
	6-19	16	6	10
	20-39	33	13	20
	40-59	74	29	45
	60-79	48	19	29
	≥80	27	10	17
mental disorder due to sedatives or hypnotics	**6-19**	<5	1	1
	20-39	35	12	23
	40-59	42	15	27
	60-79	47	16	31
	≥80	18	6	12

base case analysis: <5=2

Appendix 5 Disease-specific weighted average unit costs (€) for the calculation of the substance-attributable inpatient and surgical day care hospital care episodes

ICD-9	disease/condition	weighted average unit cost
421	acute & subacute infective endocarditis	€ 17,301
205	acute myeloid leukaemia	€ 17,777
577	acute pancreatitis	€ 5,551
305	alcohol abuse	€ 4,081
425.5	alcoholic cardiomyopathy	€ 5,567
303	alcoholic dependence syndrome	€ 4,141
535.3	alcoholic gastritis	€ 4,488
571	alcoholic liver disease	€ 8,504
357.5	alcoholic polyneuropathy	€ 5,395
291	alcoholic psychosis	€ 4,137
493	asthma	€ 3,063
440-449	atherosclerosis	€ 7,456
188	bladder cancer	€ 4,833
174	breast cancer	€ 4,813
427	cardiac arrhythmia	€ 4,757
180; 233.1	cervical cancer	€ 3,263
574	cholelithiasis	€ 3,800
970.81	injury & poisoning due to cocaine	€ 2,819
770	congenital pneumonia	€ 4,704
490-492	COPD	€ 6,469
331.7	degeneration of nervous system due to alcohol	€ 9,011
250	diabetes mellitus	€ 5,603
292	drug psychosis	€ 4,868
345	epilepsy	€ 3,317
760.71	foetal alcohol syndrome	€ 2,017
760.79	foetus and newborn affected by maternal tobacco use	€ 7,455
433-437	haemorrhagic stroke	€ 7,179
428	heart failure	€ 7,074
042-044	HIV disease	€ 9,251
401-405	hypertension	€ 5,765
965.01	injury & poisoning due to heroin	€ 4,000
969	injury & poisoning by psychotropic agents	€ 2,823
967	injury & poisoning by sedative-hypnotic drugs	€ 2,832
965	injury & poisoning due to opium	€ 2,789
965.09	injury & poisoning due to other opioids	€ 3,006
968.9	injury & poisoning due to local anaesthetics (cocaine)	€ 2,713
965.02	injury & poisoning due to methadone	€ 3,251
410-414	ischaemic heart disease	€ 5,498
430-432	ischaemic stroke	€ 12,213
161; 231.0	laryngeal cancer	€ 6,702
140-149; 23(	lip, oral cavity, and pharynx cancer	€ 6,656
155	liver cancer	€ 9,161

Appendix 5 Disease-specific weighted average unit costs (€) for the calculation of the substance-attributable inpatient and surgical day care hospital care episodes (continued)

ICD-9	disease/condition	weighted average unit cost
151; 230.2	malignant neoplasm of stomach	€ 7,063
304.7; 304.8	mental disorders due to multiple drug use	€ 4,408
304.4	mental disorders due to use of amphetamine and other stimulants	€ 4,462
304.3	mental disorders due to use of cannabinoids	€ 4,732
304.2	mental disorders due to use of cocaine	€ 3,668
304	mental disorders due to use of opioids	€ 4,182
304.1	mental disorders due to use of sedatives or hypnotics	€ 4,703
760.72; 760.75	newborn drug toxicity	€ 3,539
150; 230.1	oesophageal cancer	€ 7,223
456	oesophageal varices	€ 6,443
157; 230.9	pancreatic cancer	€ 7,405
332	parkinson disease	€ 9,172
533	peptic ulcer	€ 4,461
480-488	pneumonia and influenza	€ 5,733
641.0, 1 & 9; 655.53	pregnancy complications	€ 2,910
696	psoriasis	€ 5,663
415-417	pulmonary heart disease	€ 6,073
154.1	rectal cancer	€ 7,548
769	respiratory distress syndrome	€ 14,937
010-012	respiratory tuberculosis	€ 8,610
390-398	rheumatic heart disease	€ 11,966
798	sudden infant death syndrome	€ 2,953
989.84	toxic effect of tobacco/nicotine	€ 2,713
162	trachea, bronchus, lung cancer	€ 7,186
013-018	tuberculosis	€ 7,519
556	ulcerative colitis	€ 4,553
296.2; 296.3	unipolar major depression	€ 7,159
189	urinary tract cancer	€ 7,211
70	viral hepatitis	€ 6,109

Appendix 6 DSM-IV diagnoses pertaining to the different substance-attributable mental disorders

DSM-IV diagnosis	mental disorder
	ALCOHOL
305	abuse
303.9	dependence
291.89	alcohol-induced anxiety disorder
291.89	alcohol-induced mood disorder
291.1	alcohol-induced persisting amnestic disorder
291.2	alcohol-induced persisting dementia
291.5	alcohol-induced psychotic disorder, with delusions
291.3	alcohol-induced psychotic disorder, with hallucinations
291.89	alcohol-induced sexual dysfunction
291.89	alcohol-induced sleep disorder
303	intoxication
291	intoxication delirium
291.9	alcohol-related disorder NOS
291.81	withdrawal
291	withdrawal delirium
	AMPHETAMINE
305.7	abuse
304.4	dependence
292.89	amphetamine-induced anxiety disorder
292.84	amphetamine-induced mood disorder
292.11	amphetamine-induced psychotic disorder, with delusions
292.12	amphetamine-induced psychotic disorder, with hallucinations
292.89	amphetamine-induced sexual dysfunction
292.89	amphetamine-induced sleep disorder
292.89	intoxication
292.81	intoxication delirium
292.9	amphetamine-related disorder NOS
292	withdrawal
	CANNABIS
305.2	abuse
304.3	dependence
292.89	cannabis-induced anxiety disorder
292.11	cannabis-induced psychotic disorder, with delusions
292.12	cannabis-induced psychotic disorder, with hallucinations
292.89	intoxication
292.81	intoxication delirium
292.9	cannabis-related disorder NOS

Appendix 6 DSM-IV diagnoses pertaining to the different substance-attributable mental disorders (continued)

DSM-IV diagnosis	mental disorder
	COCAINE
305.6	abuse
304.2	dependence
292.89	cocaine-induced anxiety disorder
292.84	cocaine-induced mood disorder
292.11	cocaine-induced psychotic disorder, with delusions
292.12	cocaine-induced psychotic disorder, with hallucinations
292.89	cocaine-induced sexual dysfunction
292.89	cocaine-induced sleep disorder
292.89	intoxication
292.81	intoxication delirium
292.9	cocaine-related disorder NOS
292	withdrawal
	HALLUCINOGEN
305.3	abuse
304.5	dependence
292.89	hallucinogen-induced anxiety disorder
292.84	hallucinogen-induced mood disorder
292.11	hallucinogen-induced psychotic disorder, with delusions
292.12	hallucinogen-induced psychotic disorder, with hallucinations
292.89	intoxication
292.81	intoxication delirium
292.89	hallucinogen-persisting perception disorder
292.9	hallucinogen-related disorder NOS
	INHALANT
305.9	abuse
304.6	dependence
292.89	inhalant-induced anxiety disorder
292.84	inhalant-induced mood disorder
292.82	inhalant-induced persisting dementia
292.11	inhalant-induced psychotic disorder, with delusions
292.12	inhalant-induced psychotic disorder, with hallucinations
292.89	intoxication
292.81	intoxication delirium
292.9	inhalant-related disorder NOS
	POLYSUBSTANCE
304.8	polysubstance dependence

Appendix 6 DSM-IV diagnoses pertaining to the different substance-attributable mental disorders (continued)

DSM-IV diagnosis	mental disorder
	OPIOID
305.5	abuse
304	dependence
292.84	opioid-induced mood disorder
292.11	opioid-induced psychotic disorder, with delusions
292.12	opioid-induced psychotic disorder, with hallucinations
292.89	opioid-induced sexual dysfunction
292.89	opioid-induced sleep disorder
292.89	intoxication
292.81	intoxication delirium
292.9	opioid-related disorder NOS
292	withdrawal
	PHENCYCLIDINE
305.9	abuse
304.6	dependence
292.89	phencyclidine-induced anxiety disorder
292.84	phencyclidine-induced mood disorder
292.11	phencyclidine-induced psychotic disorder, with delusions
292.12	phencyclidine-induced psychotic disorder, with hallucinations
292.89	intoxication
292.81	intoxication delirium
292.9	phencyclidine-related disorder NOS
	SEDATIVE-, HYPNOTIC-, OR ANXIOLYTIC (SHA)
305.4	abuse
304.1	dependence
292.89	SHA-induced anxiety disorder
292.84	SHA-induced mood disorder
292.83	SHA-induced persisting amnestic disorder
292.82	SHA-induced persisting dementia
292.11	SHA-induced psychotic disorder, with delusions
292.12	SHA-induced psychotic disorder, with hallucinations
292.89	SHA-induced sexual dysfunction
292.89	SHA-induced sleep disorder
292.89	intoxication
292.81	intoxication delirium
292.9	SHA-related disorder NOS
292	withdrawal
292.81	withdrawal delirium

Appendix 6 DSM-IV diagnoses pertaining to the different substance-attributable mental disorders (continued)

DSM-IV diagnosis	mental disorder
	NICOTINE
305.1	dependence
292.9	nicotine-related disorder NOS
292	withdrawal
	OTHER (OR UNKNOWN)
305.9	abuse
304.9	dependence
292.89	other-induced anxiety disorder
292.81	other-induced delirium
292.84	other-induced mood disorder
292.83	other-induced persisting amnestic disorder
292.82	other-induced persisting dementia
292.11	other-induced psychotic disorder, with delusions
292.12	other-induced psychotic disorder, with hallucinations
292.89	other-induced sexual dysfunction
292.89	other-induced sleep disorder
292.89	intoxication
292.9	other-related disorder NOS
292	withdrawal
293	delirium due to... [indicate the general medical condition]

Appendix 7a Age- and sex-specific number of substance-attributable psychiatric hospital admissions and mean stay/admission (days)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Alcohol-related disorders	0-5	<5	9.00						
	6-19	20	50.40	<5	0.00	26	52.88	<5	22.00
	20-39	2362	55.77	186	70.18	921	51.88	129	65.74
	40-59	5484	78.70	567	107.79	2704	69.82	414	110.01
	60-79	1290	104.50	162	130.07	688	94.01	95	153.24
	>=80	25	110.60	<5	366.00	23	104.61	<5	95.50
Amphetamine-related disorders	0-5								
	6-19	10	18.80			11	28.00		
	20-39	305	60.51	25	85.20	112	55.99	<5	165.67
	40-59	52	76.79	6	220.17	15	84.67	<5	171.00
	60-79	<5	22.67	<5	86.33	<5	157.33		
	>=80	<5	83.00						
Cannabis-related disorders	0-5								
	6-19	136	47.48	6	40.00	41	38.73	<5	34.50
	20-39	1063	81.38	114	91.74	212	62.24	37	122.95
	40-59	166	84.26	19	143.32	35	79.34	7	185.86
	60-79	<5	192.75			<5	67.67	<5	179.00
	>=80					<5	7.00		
Cocaine-related disorders	0-5								
	6-19	<5	17.00			7	17.43		
	20-39	244	51.86	10	23.40	108	40.80	12	59.00
	40-59	68	48.38	7	134.86	30	38.10	<5	65.00
	60-79	<5	40.00	<5	55.00				
	>=80								

Appendix 7a Age- and sex-specific number of substance-attributable psychiatric hospital admissions and mean stay/admission (days) (continued)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Hallucinogen-related disorders	0-5								
	6-19					<5	4.00		
	20-39	11	28.91	<5	22.50	5	34.00		
	40-59	<5	12.75	<5	147.00	8	28.50	<5	77.00
	60-79								
	>=80								
Inhalant-related disorders	0-5								
	6-19					<5	7.00		
	20-39	6	144.50			<5	30.75		
	40-59	<5	28.00			<5	202.00		
	60-79	<5	170.00			<5	250.50		
	>=80								
Nicotine-related disorders	0-5								
	6-19	<5	292.00						
	20-39	30	71.27	23	78.78	7	50.71	<5	84.67
	40-59	25	147.28	19	132.95	13	69.85	8	132.25
	60-79	<5	201.75			<5	19.50		
	>=80								
Opioid-related disorders	0-5								
	6-19	5	6.80			<5	36.33		
	20-39	610	38.40	22	28.09	177	41.53	15	5.47
	40-59	254	54.96	31	35.74	67	46.22	13	91.85
	60-79	9	119.33	<5	0.00	9	40.89		
	>=80								

Appendix 7a Age- and sex-specific number of substance-attributable psychiatric hospital admissions and mean stay/admission (days) (continued)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Phencyclidine-related disorders	0-5								
	6-19								
	20-39	6	63.50			<5	206.50		
	40-59					<5	31.00		
	60-79					<5	6.00		
	>=80								
Sedative-,Hypnotic, or Anxiolytic-relate(	0-5								
	6-19	<5	46.67	<5	214.00	<5	16.33		
	20-39	156	57.19	18	69.00	143	41.40	<5	23.25
	40-59	137	73.68	20	122.30	278	68.10	26	128.42
	60-79	40	77.43	<5	117.50	120	98.63	13	225.00
	>=80	<5	123.00			14	94.00		
Polysubstance-related disorders	0-5								
	6-19	62	44.52	<5	108.00	37	30.03		
	20-39	1267	76.59	86	89.92	301	53.06	35	62.94
	40-59	341	90.42	37	112.86	169	58.61	13	68.69
	60-79	10	136.00	<5	135.33	21	79.05	<5	366.00
	>=80								
Other(or unknown) substance-related d	0-5								
	6-19	9	22.78			<5	14.00		
	20-39	158	63.23	13	114.54	45	46.36	<5	114.00
	40-59	56	112.48	<5	258.67	62	75.63	8	133.38
	60-79	35	112.09			18	93.56	<5	109.00
	>=80	7	89.00			10	72.30	<5	230.00

Appendix 7b Age- and sex-specific number of substance-attributable psychiatric ward in general hospital admissions and mean stay/admission (days)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Alcohol-related disorders	0-5								
	6-19	48	10.46	<5	366.00	31	4.55		
	20-39	2275	18.82	92	32.57	1017	20.38	48	42.42
	40-59	5090	25.87	251	67.45	3221	26.58	272	76.89
	60-79	1124	34.90	54	98.07	855	31.35	48	122.71
	>=80	29	25.10			22	78.82		
Amphetamine-related disorders	0-5								
	6-19	11	21.09			11	9.27		
	20-39	154	18.32	<5	64.50	103	10.90	5	60.80
	40-59	53	13.53			51	26.37	<5	47.67
	60-79	5	21.40			23	19.30		
	>=80	<5	366.00						
Cannabis-related disorders	0-5								
	6-19	65	10.88	<5	15.00	23	28.65	<5	17.00
	20-39	454	20.96	15	95.93	148	20.10	16	36.50
	40-59	76	28.04	6	180.33	42	36.12	<5	122.00
	60-79	<5	21.00			<5	186.50		
	>=80								
Cocaine-related disorders	0-5								
	6-19	<5	13.50			<5	4.00		
	20-39	142	24.13	<5	16.50	66	20.32	<5	189.50
	40-59	51	17.78	<5	43.00	20	28.65	<5	17.00
	60-79	<5	4.00			<5	4.00	.	
	>=80								

Appendix 7b Age- and sex-specific number of substance-attributable psychiatric ward in general hospital admissions and mean stay/admission (days) (continued)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Hallucinogen-related disorders	0-5								
	6-19	<5	3.00						
	20-39	10	53.20			<5	12.00		
	40-59								
	60-79								
	>=80								
Inhalant-related disorders	0-5								
	6-19								
	20-39	5	24.60						
	40-59	<5	19.33			<5	73.00		
	60-79					.			
	>=80								
Nicotine-related disorders	0-5								
	6-19					<5	52.00		
	20-39	9	65.33			13	24.38	<5	329.50
	40-59	22	68.50	<5	197.50	30	92.57	<5	122.33
	60-79	11	24.82	<5	366.00	11	34.73	<5	200.00
	>=80								
Opioid-related disorders	0-5								
	6-19	<5	29.00	.	.	<5	11.50	.	.
	20-39	157	17.38	<5	20.00	104	19.17	<5	52.33
	40-59	100	52.50	<5	183.00	74	28.80	<5	30.50
	60-79	12	20.17			12	54.17		
	>=80	<5	16.00						

Appendix 7b Age- and sex-specific number of substance-attributable psychiatric ward in general hospital admissions and mean stay/admission (days) (continued)

mental disorder	age-band (years)	males				females			
		Full-time admissions		Part-time admissions		Full-time admissions		Part-time admissions	
		number	mean stay (days)	number	mean stay (days)	number	mean stay (days)	number	mean stay (days)
Phencyclidine-related disorders	0-5								
	6-19	<5	17.00						
	20-39	<5	2.00						
	40-59	<5	13.00			<5	37.00		
	60-79								
	>=80								
Sedative-,Hypnotic, or Anxiolytic-relate	0-5								
	6-19	15	9.40	<5	79.00	21	10.52		
	20-39	222	16.80	6	18.67	303	19.35	5	60.00
	40-59	284	22.50	8	66.38	632	23.53	25	52.60
	60-79	59	30.83	<5	30.00	241	30.56	<5	97.00
	>=80	<5	22.75			19	17.26		
Polysubstance-related disorders	0-5								
	6-19	10	29.80			13	34.85		
	20-39	482	12.74	5	97.00	186	17.17	11	57.45
	40-59	171	19.26	12	91.33	127	23.09	19	65.74
	60-79	15	28.60	<5	120.00	24	26.25	<5	5.00
	>=80								
Other(or unknown) substance-related d	0-5								
	6-19	14	7.07			30	10.50		
	20-39	134	15.31	<5	0.25	163	10.85	5	53.80
	40-59	104	18.43	<5	82.50	174	22.71	<5	53.00
	60-79	35	26.20			63	35.51	<5	57.00
	>=80	<5	17.33			<5	10.75		

Appendix 8 Disease-specific years of life lost up to the age of 65 years

ICD-10	disease/condition	years of life lost
A15-19	tuberculosis	43
B20-24	HIV disease	651
B16-18	viral hepatitis	306
C00-14	lip, oral cavity, and pharynx cancer	2853
C15	oesophageal cancer	2157
C16	malignant neoplasm of stomach	2032
C18	colon cancer	3535
C20	rectal cancer	960
C22	liver cancer	2172
C25	pancreatic cancer	3069
C32	laryngeal cancer	658
C33-34	trachea, bronchus, lung cancer	15107
C50	breast cancer	7507
C53	cervical cancer	1176
C67	bladder cancer	993
C64-66	urinary tract cancer	1033
C92.0	acute myeloid leukaemia	1095
E10-14	diabetes mellitus	1693
F10.0, 10.3-10.9	alcoholic psychosis	159
F32-33	unipolar major depression	388
F10.2	alcoholic dependence syndrome	2463
F11	mental disorder due to use of opioids	89
F12	mental disorder due to use of cannabinoids	0
F13	mental disorder due to use of sedatives or hypnotics	0
F14	mental disorder due to use of cocaine	11
F15	mental disorder due to use of amphetamine & other stimulants	1
F16	mental disorder due to use of hallucinogens	0
F19	mental disorder due to multiple drug use	552
F10.1	alcohol abuse	324
F17	mental disorders due to tobacco use	121
G31.2	degeneration of nervous system due to alcohol	36
G20	Parkinson disease	134
G40-41	epilepsy	1861
G62.1	alcoholic polyneuropathy	20
I00-9	rheumatic heart disease	91
I10-15	hypertension	514
I20-25	ischaemic heart disease	10026
I26-28	pulmonary heart disease	1796
I33	acute & subacute infective endocarditis	29
I42.6	alcoholic cardiomyopathy	119
I47-49	cardiac arrhythmias	1663
I50-51	heart failure	2632

Appendix 8 Disease-specific years of life lost up to the age of 65 years (continued)

ICD-10	disease/condition	years of life lost
I60-62	ischaemic stroke	3451
I63-66	haemorrhagic stroke	1670
I70-79	atherosclerosis	1032
I85	oesophageal varices	205
A15-16	respiratory tuberculosis	108
J10-18	pneumonia and influenza	1523
J40-44	COPD	3124
J45-46	asthma	523
K27	peptic ulcer	30
K29.2	alcoholic gastritis	0
K51	ulcerative colitis	6
K70	alcoholic liver disease	5023
K74	liver cirrhosis	2695
K80	cholelithiasis	8
K85	acute pancreatitis	518
K86	chronic pancreatitis (alcohol induced)	127
L40 (excl. 40.5)	psoriasis	0
O44-46, O67, O35.5-6	pregnancy complications	0
Q86.0	foetal alcohol syndrome	0
P04.4	newborn drug toxicity	0
P04.2	foetus and newborn affected by maternal tobacco use	43
P02.0-2, P04.8, P05-07, P96.1	opiate caused low birthweight	0
P05-07	short gestation/low birthweight	1075
P22	respiratory distress syndrome	602
P23	congenital pneumonia	86
P24	neonatal aspiration syndromes	86
P25	interstitial emphysema	86
P26	pulmonary haemorrhage	43
P27	chronic respiratory disease	86
P28	other respiratory conditions	129
R95	sudden infant death syndrome	1290
T40.0	injury and poisoning due to opium	0
T40.1	injury and poisoning due to heroin	177
T40.2	injury and poisoning due to other opioids	54
T40.3	injury and poisoning due to methadone	278
T42	injury and poisoning due by sedative-hypnotic drugs	465
T41.3	injury and poisoning due to local anaesthetics (cocaine)	0
T40.7	injury and poisoning due to cannabis	0
T40.5	injury and poisoning due to cocaine	125
Y15	ethanol & methanol toxicity	35
T65.2	toxic effect of tobacco/nicotine	0

Appendix 9a Average substance-attributable fractions for the estimation of years of life lost from premature mortality: ALCOHOL

disease/condition	age-band (years)	substance-attributable fraction		
		males	females	average
lip, oral cavity, pharynx cancer				0.31
	20-39	0.31	0.27	
	40-59	0.35	0.32	
oesophageal cancer				0.42
	20-39	0.42	0.39	
	40-59	0.45	0.43	
rectal cancer				0.05
	20-39	0.07	0.00	
	40-59	0.09	0.01	
liver cancer				0.32
	20-39	0.31	0.28	
	40-59	0.35	0.33	
pancreas cancer				0.09
	20-39	0.09	0.08	
	40-59	0.10	0.10	
laryngeal cancer				0.45
	20-39	0.44	0.41	
	40-59	0.48	0.46	
breast cancer				0.06
	20-39	0.00	0.11	
	40-59	0.00	0.12	
epilepsy				0.33
	20-39	0.26	0.28	
	40-59	0.38	0.42	
hypertension				0.28
	20-39	0.28	0.24	
	40-59	0.32	0.27	
ischaemic heart disease				-0.17
	20-39	-0.18	-0.16	
	40-59	-0.18	-0.17	
cardiac dysrhythmia				0.32
	20-39	0.32	0.29	
	40-59	0.34	0.32	
ischaemic stroke				-0.32
	20-39	-0.04	-0.58	
	40-59	-0.02	-0.62	
haemorrhagic stroke				-0.05
	20-39	0.21	-0.39	
	40-59	0.24	-0.26	

Appendix 9a Average substance-attributable fractions for the estimation of years of life lost from premature mortality: ALCOHOL (continued)

disease/condition	age-band (years)	substance-attributable fraction		
		males	females	average
oesophageal varices				0.43
	20-39	0.31	0.33	
	40-59	0.44	0.62	
cholelithiasis				-0.26
	20-39	-0.33	-0.17	
	40-59	-0.36	-0.19	
acute pancreatitis				0.23
	20-39	0.23	0.20	
	40-59	0.26	0.22	
chronic pancreatitis				0.23
	20-39	0.23	0.20	
	40-59	0.26	0.22	
psoriasis				0.34
	20-39	0.34	0.31	
	40-59	0.36	0.33	
diabetes mellitus				-0.04
	20-39	-0.01	-0.07	
	40-59	-0.02	-0.07	
heart failure				0.02
	20-39	0.01	0.00	
	40-59	0.03	0.01	
unipolar major depression				0.28
	20-39	0.16	0.36	
	40-59	0.20	0.42	

Appendix 9b Average substance-attributable fractions for the estimation of years of life lost from premature mortality: TOBACCO

disease/condition	age-band (years)	substance-attributable fraction		
		males	females	average
respiratory tuberculosis/pneumonia &	35-54	0.57	0.60	0.69
influenza/COPD	55-64	0.83	0.75	
trachea, bronchus, lung cancer	35-54	0.87	0.77	0.84
	55-64	0.86	0.85	
lip, oral cavity, and pharynx cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
oesophageal cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
malignant neoplasm of stomach	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
pancreatic cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
laryngeal cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
cervical cancer	35-54	0.00	0.10	0.09
	55-64	0.00	0.26	
bladder cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
urinary tract cancer	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
acute myeloid leukaemia	35-54	0.24	0.10	0.21
	55-64	0.26	0.26	
ischaemic heart disease	35-54	0.52	0.54	0.47
	55-64	0.42	0.38	

Appendix 9c Average substance-attributable fractions for the estimation of years of life lost from premature mortality: ILLICIT DRUGS

disease/condition	age-band (years)	substance-attributable fraction		
		males	females	average
HIV disease	20-39	0.08	0.03	0.03
	40-59	0.01	0.00	
acute & subacute infective endocarditis	20-64	0.14	0.14	0.14
viral hepatitis	20-64	0.42	0.42	0.42
tuberculosis	20-64	0.10	0.10	0.10

Appendix 10 Nomenclature numbers per non-surgical hospital day care lump sum group

293414	293425	Verwijderen van een exostose onder een nagel
~~300370~~ [49]	~~300381~~	~~Acromioclaviculaire arthroplastiek~~
471796	471800	Bronchoscopie met extractie van vreemde lichamen of plaatsing van een prothetisch element