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COST AND FINANCING OF DRUG TREATMENT SERVICES IN EUROPE: AN EXPLORATORY STUDY

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Introductory note and acknowledgements

In-depth reviews of topical interest are published as Selected issues each year. These reports are based on information provided to the EMCDDA by the EU Member States, the candidate countries Croatia and Turkey, and Norway as part of the national reporting process.

The most recent Selected issues are:

- Treatment and care for older drug users
- Problem amphetamine and methamphetamine use in Europe
- Trends in injecting drug use in Europe
- Drug offences: sentencing and other outcomes
- Polydrug use: patterns and responses

All Selected issues (in English) and summaries (in up to 23 languages) are available on the EMCDDA website: http://www.emcdda.europa.eu/publications/selected-issues

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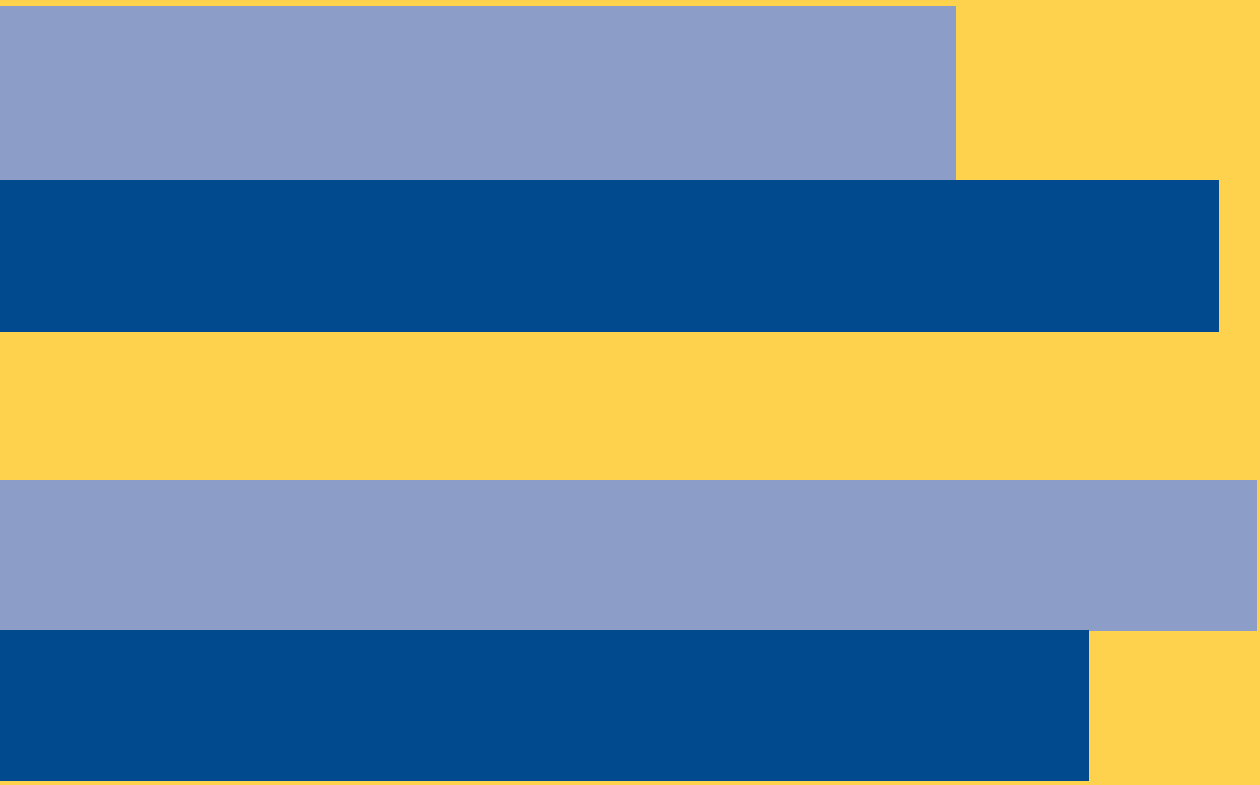
- the heads of Reitox national focal points and their staff;
- the services within each Member State that collected the raw data;
- the members of the Management Board and the Scientific Committee of the EMCDDA;
- the Publications Office of the European Union.

Reitox national focal points

Reitox is the European information network on drugs and drug addiction. The network is comprised of national focal points in the EU Member States, Norway, the candidate countries and at the European Commission. Under the responsibility of their governments, the focal points are the national authorities providing drug information to the EMCDDA.

The contact details of the national focal points may be found at:
http://www.emcdda.europa.eu/about/partners/reitox-network



Exploring the cost and financing of drug treatment services in Europe

Introduction

Recent estimates suggest that, each year, over 1 million Europeans receive treatment for problems related to the use of illicit drugs (EMCDDA, 2010). Of these, more than half receive opioid substitution treatment for problems related to opioid drugs, primarily heroin. The current levels of provision of drug treatment services in the European Union are the result of an expansion of services that has taken place during the last two decades. For much of that time, services expanded against a background of a growing drug problem, and one in which economic conditions were largely favourable. Now, however, in an era of cuts in government expenditure, managing the costs of treatment and ensuring the highest quality and best outcomes for the lowest possible cost are priorities.

While measuring and improving drug treatment outcomes have been relatively high on the research agenda in recent years, the cost of treatment has received far less research attention. Addressing this information gap is likely to have a number of benefits for both decision-makers and treatment providers. On the one hand, service providers need accurate information on the costs of service provision in order to plan the allocation of resources. On the other, decision-makers and funders can use such information as a means of cost control, for example, by comparing costs of similar services or those of alternative providers of similar services. Finally, as a part of a fuller economic analysis, information on service costs is needed to determine the cost-effectiveness of interventions and treatment programmes.

The cost of drug treatment in Europe is looked at from two main angles in this Selected issue. First, it presents an overview of the main sources of drug treatment funding and the financing mechanisms that are employed in European countries. The available data are presented on who is paying for drug treatment, how funding is organised, and how funding is distributed among different treatment modalities. This is followed by an analysis of the unit costs of different types of drug treatment. Costs related to opioid substitution treatment including the costs of substitution medication for a number of European countries are presented here. This publication keeps a tight focus on the cost of drug treatment and does not attempt to undertake a broader economic analysis of the healthcare and social costs relating to illicit drugs.

This Selected issue represents a first attempt to provide a European overview of drug treatment costs, and individual countries are brought into focus to illustrate specific aspects of the analysis. This subject is both topical and methodologically challenging. The varying availability of information as well as the complexity of funding arrangements mean that, at best, only very incomplete estimates can be made of the costs of (or expenditure on) drug treatment in Europe.

Methods and data sources

The limited available information on cost of treatment in Europe comes from two main sources: cost studies, and national information on expenditure. The principal sources of data for this Selected issue are the Reitox national focal points — the EMCDDA's network of national partners in the 27 EU Member States, two candidate countries and Norway. The national focal points of 13 of these countries provided data on drug treatment cost and financing in their 2010 Reitox national reports. This information varied in scope and depth, and the present exploratory analysis is based primarily on detailed information from four countries — the Czech Republic, Germany, Luxembourg and the United Kingdom (England). These data have been supplemented by information provided by individual national experts as well as findings from the scientific literature.

Information on the cost of drug treatment was collected using EMCDDA definitions, focusing on detoxification, inpatient and outpatient psychosocial treatment and opioid substitution treatment. Efforts were made to avoid including expenditure on activities not falling within the working definitions of drug treatment, such as prevention and treatment of alcohol dependence. However, disaggregating national data in such a manner was not always possible.

Cost may be defined in a number of ways: (a) the amount of cash paid for a good or service, that is to say the cash flow associated with purchasing a good or service; (b) the value of the resources used in acquiring a good or service, whether paid for or not; or (c) the purchase price of a good or service. This Selected issue, while mindful of the broader definition, considers cash flows only, excluding non-paid-for resources such as in-kind goods and services (e.g. volunteers), full rent, depreciation on donated buildings and debt.

Approaches to estimating cost of treatment

There are two basic approaches for producing a cost of treatment estimate: 'bottom-up' and 'top-down'.

The top-down approach involves examining all costs of a treatment programme over a given period of time, and allocating resource use according to the number of patients treated. This method ensures that all known costs attributable to the service are allocated to an activity. For many services, only broad totals may be available and such a generic approach would be needed. In programmes where a variety of activities take place, additional data would need to be collected to determine a basis on which costs are allocated.

The bottom-up approach involves identifying and monitoring each activity and directly measuring the relevant resource use. Detailed resource tracing ensures that a proportion of the capital cost and overheads are allocated to each unit of activity. With good resource management systems, this approach can give very accurate costs for each client. However, it is likely that this methodology will not always result in a total cost figure for the treatment programme's activity equal to the actual expenditure over the period being examined. For example, costs of building and maintenance may be omitted in the cost figure.

Bottom-up costing allows more detailed analysis of the factors influencing resource use than a top-down approach, which only produces average figures. It can, however, involve extensive information systems, which can be costly. The desirability of detailed costs information varies with the type of intervention. For simple and brief interventions, detailed costing is often too elaborate, but it is more appropriate for costing the longer-term treatment of clients who may be more intensive users of resources. In practice, a mixture of methodologies is used with some costs being allocated to activities in a top-down approach while other resource use can be more accurately traced.

Cost analysis is a prerequisite for full economic evaluations in which both the costs and the consequences (outcomes) of drug treatment are examined and compared. This type of evaluation addresses questions of value for money.

Drug treatment in Europe

In this Selected issue, data have been collected on the four modalities of drug treatment identified by the EMCDDA as most frequently used in Europe: detoxification, opioid substitution, inpatient and outpatient psychosocial interventions. Detoxification is a medically supervised intervention to resolve withdrawal symptoms associated with chronic drug use, and is sometimes a prerequisite for initiating long-term abstinence-based inpatient treatment. Typically, detoxification is provided as an inpatient intervention in hospitals, specialist treatment centres or residential facilities with medical or psychiatric wards; in some countries (e.g. Belgium, the Netherlands, the United Kingdom), it can be carried out in outpatient facilities (Muscat et al., 2010).

In inpatient treatment settings, clients often receive individually structured psychosocial treatments and participate in activities designed to help them rehabilitate into society. Psychosocial treatment based on the therapeutic community model is common in a number of countries (e.g. the Czech Republic, Italy, Lithuania, Hungary, Poland, Portugal).

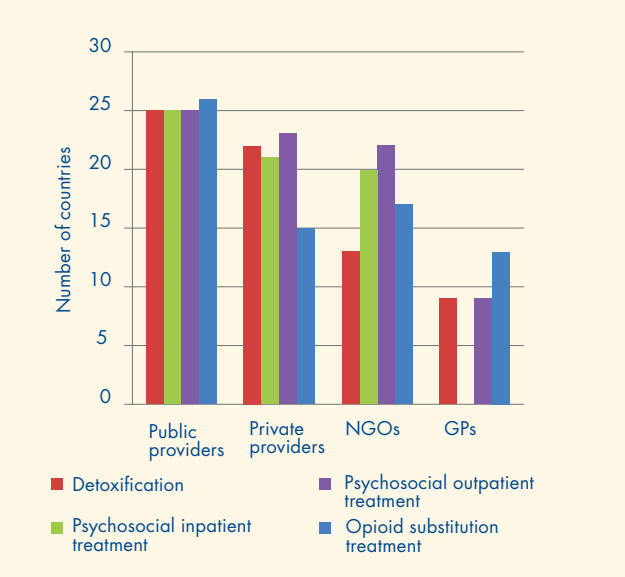
The two main modalities of drug treatment in outpatient settings in Europe are psychosocial interventions and substitution treatment. Psychosocial interventions delivered in these settings offer support to users as they attempt to manage and overcome their drug problems in the community, while allowing them to maintain their commitment to family and work. The interventions include counselling, motivational enhancement, cognitive behavioural therapy, group and family therapy, and relapse-prevention.

Substitution treatment refers to the treatment of drug dependence by prescription of a substitute drug with the goal of reducing or eliminating the use of a particular substance, or of reducing harm and negative social consequences. Substitution treatment is based on an assessment of the individual's needs, and is commonly supplemented with some form of psychosocial intervention. In practice, substitute drugs are available only for heroin; no effective substitute substances exist for the other main illicit drugs.

In addition to receiving help in specialised drug treatment facilities, drug users may also participate in self-help groups or receive treatment in primary care and other medical settings, including emergency rooms and mental health services. Costs of care provided in non-specialised facilities are not explored in this publication, with the exception of opioid substitution treatment administered through general practitioners.

In a recent EMCDDA survey among the 30 national focal points, the majority of Member States reported the public provision of treatment across the four key modalities (Figure 1). At least half of the countries reported the availability of the same treatment modalities through private providers. Apart from detoxification treatment, non-governmental organisations are reported as providers of the various treatment modalities by at least half of the countries, with a focus on psychosocial modalities. Fewer countries report the provision of treatment services by general practitioners; with substitution treatment the most often cited modality for this group of providers.

Figure 1: Providers of drug treatment in Europe



NB: Number of countries reporting the provision of the four main drug treatment modalities by the different types of provider.
NGOs: non-governmental organisations; GPs: general practitioners.
Source: Reitox national focal points.

Financing drug treatment

In the following sections, we review the main payers or funders of drug treatment services in Europe, before moving on to examine mechanisms of payment. Depending on the country, the funders of drug treatment services may include public sources, private sources and social health insurance.

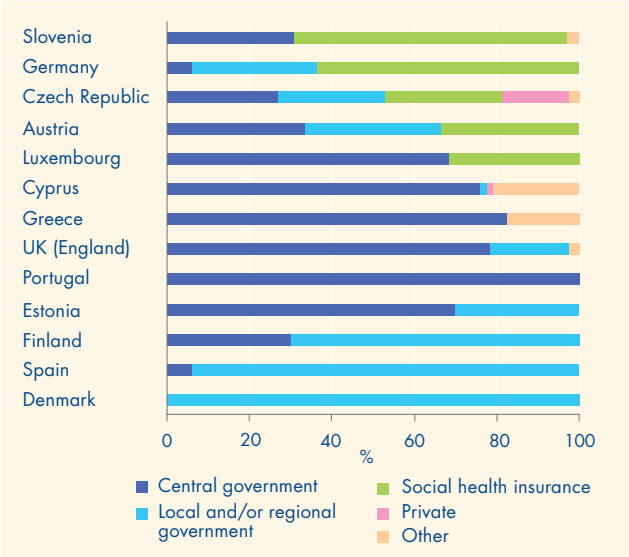
Public sources are governments that raise funds through taxes, donor grants and loans (Schieber and Akiko, 1997). These sources can operate at different administrative levels, from national to regional or local. Private sources include donors, international or domestic, financing drug treatment through grants, loans, and in-kind contributions, as well as individuals who pay fees directly to providers of drug treatment services. In a number of European countries, healthcare is financed through social health insurance, whereby workers and employers are obliged to contribute to health insurance funds which finance drug treatment. Social health insurance programmes may also receive government funds for unemployed individuals and other groups that are eligible for subsidised contributions.

In Europe, governments are the main payers for drug treatment, providing more than half of the funding in 11 of the 13 reporting countries (Figure 2). The roles played by the various levels of government, however, differ between countries. In Portugal, treatment funding is provided solely by the central government. In five further cases (Estonia, Greece, Cyprus, Luxembourg, the United Kingdom), the central government provides more than half of the funding for drug treatment. In contrast, local bodies account for all drug treatment funding in Denmark, and local or regional bodies account for over half of it in Spain and Finland. In the Czech Republic, central and lower levels of government provide roughly equal amounts, together accounting for more than half of drug treatment funding.

Funding of drug treatment by social health insurance is reported by five countries. In two of these (Germany, Slovenia), social health insurance is the main funder, while it is a substantial funder in three others (the Czech Republic, Austria, Luxembourg).

The existence of private sources of funds is reported by a number of countries, though only two provide data (the Czech Republic, Cyprus).

Figure 2: Distribution of drug treatment funding by source



NB: Data for 2008–09. For Germany, social health insurance includes both health and pension funds.

Source: Reitox national focal points.

The breakdown of drug treatment funding presented here must be regarded as a first approximation, and for some countries it was difficult to identify national figures. In many cases, data were incomplete, and for some sources there was insufficient distinction between interventions for different types of substance, for example between licit and illicit drugs. Other problems included the aggregation of treatment expenditure with that of other types of intervention (e.g. prevention, social reintegration), and lack of details on the intended use of funds. In such scenarios, examination of additional documents and analysis at a secondary (e.g. regional or service provider) level was needed to yield further details.

The complexity that may be involved in analysing drug treatment costs can be illustrated by the examples from Germany and Portugal. In Germany, the health system is funded by a multiplicity of sources, with data distributed across a large number of institutions. In Portugal, although drug treatment is financed through the state's general

Healthcare financing: the role of social security

In Europe, there are three main sources of healthcare financing: households, employers and the state. The latter includes the general government, at all levels, and social security.

Social security is a social insurance programme, imposed by governments for the purpose of providing social benefits to the community. Its programmes cover a wide variety of areas including: benefits for old age, invalidity, maternity, work injury, unemployment and healthcare (Eurostat, 2008). There is not necessarily a direct link between contributions paid by an individual and benefits received.

In the area of health, the mix of private, public expenditure and social contributions varies widely from country to country. In the European Union, healthcare is primarily funded by the public sector (73.6 % of total expenditure in 2008, on average) (OECD, 2010), with social security accounting for slightly more than general government funds, on average.

The data show that public sources fund most of the healthcare expenditure in Europe. However, they do not play a dominant role in every area. While the public sector paid an average of 82 % of medical services (e.g. outpatient services) in 2008, it only funded about 50 % of medical goods (e.g. pharmaceuticals).

budget, EU Structural and Cohesion Funds are accessed and used for specific activities, such as drug treatment infrastructure development. This mix of national and international shared financing, typically with multi-year funds committed to buildings and renovation, means that they are not necessarily reflected in each year's annual budget.

Drug treatment funding and non-governmental organisations

As shown above, there is substantial variation in the breakdown between public and private funding of drug treatment. The picture becomes more complex with the subcontracting of the provision of drug treatment services (along with clinical staff training, informing and working with the local community) to non-governmental organisations (NGOs). This refers to any public purchasing or donor financing of services from private providers, both for profit and non-profit. In 2008, while publicly owned facilities are all entirely funded by public sources, NGOs had overall considerable but less public funding, in the range of 70 % to 80 % in Spain, Greece and Luxembourg.

Luxembourg is unique in that all specialised drug treatment is provided through a nationwide network of NGOs, financially supported by and accountable to the Ministry of Health. In Finland, NGOs or private service providers account for more than half of specialised drug treatment provided in the country (Kekki and Partanen, 2008).

In other countries, although NGOs play an important part in drug treatment, their contribution to the overall provision of service is not well documented. This is the case in England, where treatment provided by NGOs is paid for by central and local governments. In parts of Germany (e.g. the city states), *Länders* co-finance NGOs by distributing 'subject-related lump sums' for the provision of psychosocial interventions to clients in opioid substitution treatment. Typically, in countries reporting such forms of target and impact-oriented distribution and use of resources, these practices are supported by framework agreements between individual ministries and local NGOs.

In addition to receiving public funding, NGOs may also make their own financial contribution to the costs of drug treatment. Examples of this include the use of church tax in Germany, and funds from enterprises connected to drug treatment programmes, where treatment clients produce goods (Greece) or provide services in the local community (Austria). In addition to funds derived from the state and their own sources, NGO-run programmes may charge clients fees, and they may receive donations in cash and other assets (e.g. buildings, land).

Administrative level for drug treatment funding

Separate from the question of who funds drug treatments, is the administrative level at which funds are managed. Despite the diversity of ways in which drug treatments are financed from a range of public and private sources, in most of the 13 countries, funds are managed at national level (Table 1). The exceptions are Finland, which reports no national-level management of these funds, and Germany, where only funds for model treatment projects (e.g. treatment research) are managed at this level. Administration of funds at local government level is reported by seven countries, while four countries administer funds at the regional or provincial level. In half of the 13 countries, funds are managed at more than one level of government.

Payment mechanisms

Having examined the main payers or funders of drug treatment services in Europe, below we review another feature that can be used to describe the interaction between funders and drug treatment providers: the mechanisms of payment.

Prospective annual budgets for providers are frequently used as the mechanism for disbursing funds to public drug treatment providers — either directly from the Ministry of Health, or through local government administrations to their network of provider organisations in the form of grants. Under such arrangements, in England, the annual pooled treatment budget is calculated and allocated to local services by taking into account, among others, factors such as caseload complexity of the local treatment population and their specific problems, and other drug users.

Case-based payments combine the estimated costs associated with all drug treatment interventions typically involved in the treatment of drug problems and result in a set payment for each case (patient) treatment episode, according to a predetermined payment schedule based on the estimated total cost. Inpatient detoxification in hospitals in Germany and Austria is paid for according to this principle.

Table 1: Levels of government at which drug treatment funding is managed

	National	Regional	Local
Czech Republic	X	X	X
Denmark			X
Germany	Model projects only	X	X
Estonia	X		
Greece	X		
Spain	X	X	X
Cyprus	X		
Luxembourg	X		
Austria	X	X	X
Portugal	X		
Slovenia	X		X
Finland			X
United Kingdom (England)	X		X

Source: Reitox national focal points.

In some countries, treatment providers are offered cost-based retrospective reimbursements, based on the providers' costs or set according to the 'prevailing' charge in a local community. In some Austrian provinces, for instance, non-hospital inpatient drug treatment programmes can be reimbursed for the daily costs of the individual services delivered to patients, subject to case-by-case approval.

Finally, in several countries, individual treatment providers are paid on a fee-for-service basis. For example, in England, community pharmacies that offer their services to the National Health Service within the supervised consumption scheme are retrospectively reimbursed from a secondary care specialist budget, based on the number of prescriptions dispensed (NTA, 2006).

Countries report changes that could have important implications for the funding and delivery of drug services in the future. For example, in England, payment-by-results pilot projects are being introduced in drug treatment funding. This scheme aims to give providers from all sectors incentives for better performance (see the box on this page).

Payment by results approaches

The United Kingdom's National Treatment Agency (NTA) for Substance Misuse (England only), with involvement from a number of government departments, is testing a range of new approaches for the commissioning and delivery of drug treatment and recovery systems that reward achievement of outcomes.

The current funding system pays service providers an agreed budget, regardless of outcomes. Under the pilot scheme, providers of drug treatment will be paid, after they have provided the service, on the basis of the results they achieve in terms of long-term recovery. They are encouraged to support all treatment clients, including those in contact with the criminal justice system and people dependent on alcohol.

Payment by results for drug treatment services is based on outcome measures such as leaving treatment in a planned way, being drug-free and back to work, and improved health and well-being. To achieve this, the scheme aims to give clients the full range of support services to sustain recovery and integrate into society. A recent report argued, however, that this will pose 'enormous practical challenges for those delivering services and for managing the system', as a wide range of providers will need to cooperate to address multiple clients' needs (UKDPC, 2011).

Estimating expenditure on drug treatment in Europe

Efforts to quantify European expenditure on drug treatment are still at an early stage. Two main advances in data collection are required in order to be able to describe drug treatment expenditure in the European Union. The first of these concerns gathering comprehensive information on drug treatment expenditure; the second concerns expanding the collection of data on drug treatment clients to include the total in-treatment population. In each of these areas, appropriate methodologies that can be used by all Member States are needed.

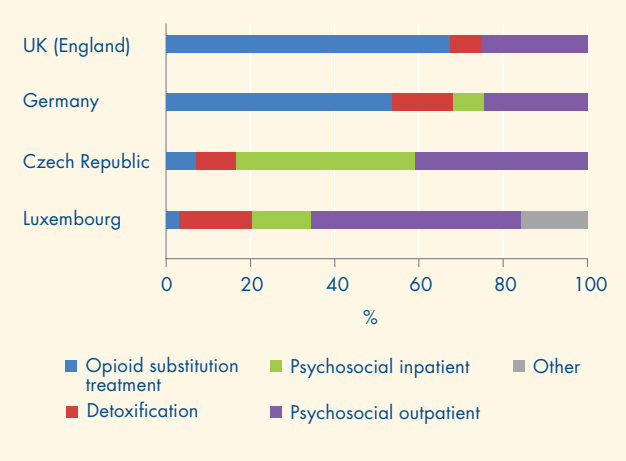
From the limited information available for nine European countries, it can be roughly estimated that annual expenditure on drug treatment in these Member States equates to between EUR 1 and EUR 20 per head of the adult population. The data on which these estimates are based, while mostly referring to the years 2007–09, also include figures from 1999 and 2002. Furthermore, the available data are insufficient to estimate the total cost of drug treatment in Europe. For seven countries, estimates of treatment expenditure and the population of treatment clients allow the average expenditure per client to be calculated. For these seven countries, the average annual expenditure for drug treatment ranges from EUR 550 to EUR 4 900 per client — with the large difference potentially influenced by the extent of utilisation of different types of treatment, each of which has a different cost associated with it.

Distribution of funding by drug treatment modality

Having, in previous sections, examined where drug treatment funds originate, here the focus is on the division of funding between the modalities of major drug treatment (detoxification, psychosocial inpatient, psychosocial outpatient, and opioid substitution treatment).

Each of the four countries for which data are available reports a different distribution of funding across the treatment modalities (Figure 3). In the United Kingdom and Germany, more than two-thirds and just over a half of the respective available treatment funds are allocated to the provision of opioid substitution treatment, though in the Czech Republic and Luxembourg, this modality accounts for less than 7 % of the available funds. In the Czech Republic, psychosocial treatment consumes the greater part of treatment resources, with inpatient and outpatient services each receiving about a third of the funding. In Luxembourg, the emphasis is on outpatient psychosocial treatment, which accounts for half of the treatment budget, and detoxification (17 %). In all four reporting countries, detoxification treatment is reported to receive not more than 20 % of drug treatment funds.

Figure 3: Distribution of funding by treatment modality



NB: Germany: the percentages are estimations based on available data that are incomplete.

Source: Reitox focal points. For Germany: Mostardt et al., 2009.

The observed differences between the reporting Member States might reflect different client needs as well as differences in treatment philosophies and methodological issues. In addition, policy contexts in each of the countries might be guiding decisions about resource allocation for different types of drug treatment. Acknowledging the data limitations, these results provide an illustration of the differences that exist between countries in relation to drug treatment resource division.

A proportion of the reported funding for drug treatment in Luxembourg is allocated to the treatment abroad of nationals, in therapeutic interventions unavailable in the country — identified as 'other' in Figure 3. For Luxembourg, data on substitution treatment costs refer to interventions provided in non-specialist settings.

Distribution of funding proportions by treatment modality can be exemplified by Germany. Detoxification costs include costs related to the provision of medical treatment and detoxification in both general hospital units and in psychiatric wards, as reported by Mostardt et al. (2009). Although some of this expenditure may be related to other aspects of addiction treatment, it is estimated that at least 80 % is related to initial medical treatment and detoxification. Data are not available on the total cost of substitution treatment in Germany. Nonetheless, an initial calculation, based on the cost of visits to general practitioners providing substitution treatment (Mostardt et al., 2009) and an 8 % indirect cost, yields an estimate of EUR 844 million (EUR 801 million, price year 2006) ([1]) as the annual cost of opioid substitution treatment. Expenditure of about EUR 387 million (EUR 367 million, price year 2006) on psychosocial outpatient treatment is indicative of the cost of providing outpatient counselling to users dependent on opioids, cannabis and stimulants ([2]); expenditure on psychosocial inpatient treatment was estimated at EUR 118 (EUR 112 million, price year 2006) (Mostardt et al., 2009).

([1]) Expenditure figures are adjusted for 2009, using consumer price indices for Germany (OECD, 2010).

([2]) Additional funding for psychosocial outpatient treatment is provided by local governments but these resources are not accounted for as data were unavailable.

Unit costs of drug treatment

Having examined the distribution of funding across treatment modalities, this section focuses on the unit costs for the main treatment modalities. In treatment studies, unit costs are generally presented as the daily cost of providing a patient with a particular type of treatment. Factors such as treatment settings and treatment interventions that are typically employed in Europe will have an impact on unit costs. The data available for unit costing are very limited for all types of treatment modality, though less so for opioid substitution treatment. The data used here come from national focal points and studies published in the scientific literature. Clinical studies may include costs that are imposed on providers by research protocols and may therefore be higher than the costs in everyday clinical practice. To allow more direct comparisons, all unit costs have been adjusted to 2009 prices, using country-specific consumer price indices (CPI) (OECD, 2010). Cost figures from the original price year are reported in brackets.

Detoxification

For this analysis, data on detoxification are available only from two countries, where inpatient detoxification is provided at a cost of EUR 199 (England) and EUR 247 (Germany) per patient per day. Studies on the costs of inpatient detoxification in Europe are rarely published in the literature. The few studies reviewed here concern the United Kingdom (England) and most are based on data that are at least 10 years old. The National Treatment Outcomes Research Study (NTORS) in England, based on data from eight agencies, estimated the cost of providing inpatient detoxification at between EUR 110 (EUR 93, price year 1999/2000) and EUR 303 (EUR 254, price year 1999/2000) per patient per day, with an average of about EUR 206 (EUR 174, price year 1999/2000) per patient per day (Godfrey et al., 2004). The follow-up to NTORS, the Drug Treatment Outcome Research Study (DTORS), based on 283 patients in inpatient treatment (detoxification) in England, reported a cost of EUR 182 (EUR 172, price year 2006/07) per patient per day (Davies et al., 2009). Also in England, Gossop and Strang (2000) compared the costs of opioid detoxification in two different settings: a specialist inpatient drug dependence unit and a drug dependence outpatient clinic. Detoxification provided in inpatient settings was estimated to cost EUR 200 (EUR 168, price year 1999/2000) per patient per day, compared to EUR 8 (EUR 7, price year 1999/2000) per patient per day for the same treatment in outpatient settings. The authors of this study took their calculations one stage further, and looked at cost-effectiveness. They adjusted the costs of the treatment packages according to inpatient and outpatient detoxification completion as measured in earlier trials (Gossop et al., 1986; Strang et al., 1997). With successful detoxification completion rates of 81 % among inpatient clients and 17 % among outpatient clients, inpatient detoxification was found to be the more cost-effective of the two approaches.

Inpatient and outpatient psychosocial treatment

Information on the overall costs or the unit costs of psychosocial treatment is available for the Czech Republic, Germany, Sweden, the United Kingdom and Norway. Based on national focal point data for 2008/09, in the Czech Republic, the total annual cost of inpatient treatment and residential rehabilitation was EUR 10 million, of which EUR 7 million was attributed to inpatient treatment and EUR 3 million to residential rehabilitation in therapeutic communities. In Germany, the annual cost of psychosocial inpatient treatment and rehabilitation is reported at about EUR 118 million (EUR 112 million, price year 2006) (Mostardt et al., 2009), however, there are no activity data to estimate daily cost per treated client.

England's NTORS showed cost estimates, based on a variety of national sources and specific data collection for the study, ranging from EUR 59 (EUR 50, 1999/2000 prices) to EUR 216 (EUR 181, price year 1999/2000) per resident per day across 15 agencies offering residential rehabilitation (Godfrey et al., 2004). More recent cost analysis of residential rehabilitation provided to 261 participants in DTORS determined a cost of EUR 56 (EUR 53, price year 2006/07) per resident per day (Davies et al., 2009). Another English study reported daily costs varying from

EUR 79 (EUR 75, price year 2007) to EUR 288 (EUR 272, price year 2007) per resident across 11 residential rehabilitation units (Curtis, 2008). An estimate for Sweden puts the average cost of residential care in that country at EUR 404 (EUR 369, price year 2002) per patient per day (Ramsteadt, 2006). In Norway, the estimated cost of residential rehabilitation is at EUR 234 (EUR 202, price year 2001) (Melberg et al., 2003). The Czech Republic and Germany provided overall cost estimates for outpatient psychosocial treatment. Based on national focal point data for 2008/09, the annual cost of psychosocial outpatient treatment in the Czech Republic is estimated at about EUR 4 million. For Germany, Mostardt et al. (2009) report the cost of psychosocial outpatient treatment at about EUR 387 million (EUR 367 million, price year 2006).

Opioid substitution treatment

Two countries provided unit cost data for substitution treatment. In England, prescription of opioid substitution drugs by specialist services is estimated to cost EUR 10 per patient per day. Luxembourg reports unit cost data for substitution treatment prescribed through general practitioners to be EUR 7 per patient per day.

From published studies, it is possible to extract additional data on unit costs. In England, a research study, based on 401 clients from seven clinics specialising in substitution treatment, estimated the range of costs of 'treatment as usual' (Raistrick et al., 2007). The average total cost of treatment per patient per day was EUR 3 (EUR 3, price year 2007), excluding the cost of prescribed drugs, and EUR 6 (EUR 5, price year 2007) including prescribed drugs. The study found that among the key factors influencing treatment costs across agencies were the complexity of the case mix, the amount of drugs prescribed, and the gender mix. In England, methadone maintenance was estimated to cost between EUR 2 (EUR 2, price year 2007) and EUR 24 (EUR 22, price year 2007) per patient per day in the 15 programmes studied (Curtis, 2008), while the DTORS research team, reported specialist prescribing at EUR 18 (EUR 17, price year 2006/07) per patient per day (Davies et al., 2009).

In Spain, Martinez-Raga et al. (2009) reported estimates of EUR 4 (EUR 4, price year 2004) per patient per day in methadone maintenance treatment and EUR 5 (EUR 5, price year 2004) per patient per day in buprenorphine maintenance treatment. As these estimates exclude medication costs, they are not full unit costs. In Lithuania, Vanagas et al. (2010), based on 102 treatment clients, estimated the cost of methadone maintenance treatment at EUR 4 per patient per day (2004 prices, no CPI identified).

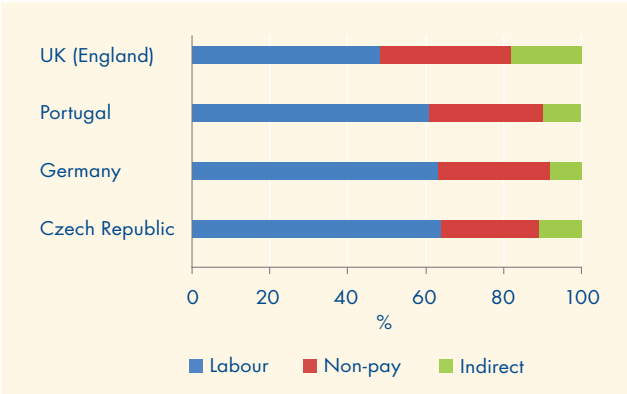
In Germany, the unit cost of oral methadone maintenance treatment ([3]) was estimated at EUR 10 (EUR 9, price year 2006) per client per day or EUR 3 490 (EUR 3 314, price year 2006) for the 12 month trial period, of which the cost of methadone accounted for about 12 % (von der Schulenburg and Claes, 2006). An estimate for Norway puts the average cost of methadone substitution treatment in that country at EUR 37 (EUR 32, price year 2001) per patient per day (Melberg et al., 2003).

The unit cost estimates for opioid substitution treatment with methadone reviewed here range from EUR 2 to EUR 37 per patient per day. This variation may reflect differences in one or more of several possible factors: national and regional drug situations and treatment systems, the case mix of patients, year of data collection, and inclusion of medication cost.

Components of substitution treatment cost

In this section, the cost of substitution treatment with oral medication (methadone and buprenorphine) will be explored in more depth. Available substitution treatment cost data are broken down into three cost categories (Figure 4): labour costs, including pay and employer contributions; non-pay costs, including medications; and indirect costs, such as rent and energy.

Figure 4: Components of opioid substitution treatment cost



NB: For the Czech Republic, the figures given represent the costs for the treatment facilities. Private costs for substitution drugs are not included in the data.

Source: Reitox national focal points.

([3]) Calculated in the context of the German heroin-assisted treatment model project, based on 200 treatment clients.

Labour costs are the largest component of opioid substitution costs, accounting for almost half (48 %) of all expenditure on substitution treatment in England, and for over half in the rest of reporting countries. Non-pay elements, predominantly medications, account for about one-third of the overall cost of opioid substitution prescription through specialist agencies. Also included in this category are costs for other medical materials and for laboratory testing in order to monitor illicit drug use. Indirect costs such as overheads accounted for, on average, about 15 % of the overall costs of substitution treatment.

Cost of opioid substitution medications

In the data presented so far, the cost of substitution medication is hidden within the broader category of direct medical costs. Yet, as both methadone and buprenorphine are commonly used in Europe as opioid substitution medications, their costs deserve closer inspection.

Oral methadone mixture is available in the participating countries as a 1 mg/ml preparation (100 ml bottle), 2 mg/ml (500 ml bottle), and in a concentrated form (10 mg/ml). For the purposes of the calculation of oral methadone cost, in the countries where more than one methadone preparation was available on the market, the most economical one has been selected. For buprenorphine, which is available in tablet form, the price of 2 mg tablets rather than 8 mg tablets was used to calculate the cost of the medication ([4]). This approach is in line with the methodology adopted for the Health Technology Assessment Programme Report in the United Kingdom (Connock et al., 2007).

The prices per milligram of medication were then examined for a mean daily dose of methadone and buprenorphine (the unit), which is based on expert estimation (unless stated otherwise) for each of the reporting countries, to arrive at the daily medication cost per patient (unit cost) in oral methadone and buprenorphine treatment. Both the prices of medications and unit costs vary considerably and, per milligram, methadone is much cheaper (EUR 0.006 to 0.05) than buprenorphine (EUR 0.23 to 1.09) (Table 2).

Comparison with the costs of supervised injectable methadone

Within the substitute prescribing modality, using injectable methadone ampoules is another prescribing option, reserved in England for patients who do not respond to oral substitute drug treatment. Compared with oral substitution treatment, the provision of injectable methadone maintenance treatment is more expensive. This is primarily due to high medication and staff costs. Strang et al. (2000) estimated a daily cost of supervised injectable methadone provision at EUR 18 (EUR 15, price year 2000) per patient per day, based on a sample of 39 heroin users randomly allocated to receive oral or injectable methadone treatment. In the same trial, the unit cost of opioid substitution treatment was calculated to be EUR 4 (EUR 3, price year 2000).

Table 2: Costs of oral opioid substitution medication

Country	Methadone (per patient treated)			Buprenorphine (per patient treated)		
	Average daily dose (mg)	Price (EUR/mg)	Unit cost (EUR/day)	Average daily dose (mg)	Price (EUR/mg)	Unit cost (EUR/day)
Czech Republic	90	0.006	0.5	6	1.05	6.3
Germany	72.6	0.02	1.5	7.1	1.09	7.7
Greece	60	0.03	1.8	8	0.23	1.8
Cyprus	n.a.			12	0.5–1.0	6.0–12.0
Finland	102	0.05	5.3	16	0.95	15.2
United Kingdom (England)	56.3	0.01	0.7	7.9	0.46	3.6

NB: Unit cost is the cost of the average daily dose of a medication for a patient; n.a., data not available.
Source: Reitox national focal points. Dose data for England are based on Strang et al. (2007). Dose data for Germany are based on unpublished information.

([4]) The calculation for the Czech Republic is based on the price of 8 mg tablets, as these are the more common form of buprenorphine used in that country.

Heroin-assisted treatment

In addition to the data on the cost of the four main treatment modalities, information is available on the cost of heroin-assisted treatment, a specialist intervention currently part of routine clinical practice in four EU Member States (Denmark, Germany, the Netherlands, the United Kingdom (England)) and Switzerland. Heroin-assisted treatment includes the provision of injectable doses of pharmaceutical heroin, closely supervised in clinical settings, to patients who have not responded to standard treatments, such as substitution treatment with oral medication.

In Switzerland, Gutzwiller and Steffen (2000) estimated the cost of heroin-assisted treatment service provision in large (232 patients), medium (150 patients) and small-scale (70 patients) supervised injectable maintenance clinics. The annual costs per patient were EUR 12 694 (EUR 11 300, price year 1995), EUR 14 379 (EUR 12 800, price year 1995) and EUR 14 492 (EUR 12 900, price year 1995) respectively — an average of EUR 37 (EUR 33) per patient per day or EUR 13 593 per year (EUR 12 100, price year 1995) for all clinics.

In the Netherlands, Dijkgraaf et al. (2005) estimated a cost of EUR 56 (EUR 48, price year 2001) per patient per day (an annual cost of EUR 20 410 (EUR 17 634, price year 2001). Similarly, in the context of the German heroin-assisted treatment model project, the average daily cost amounted to EUR 52 per patient (EUR 50, price year 2006) or EUR 19 020 per year (EUR 18 060, price year 2006).

Injectable heroin treatment has been estimated to cost between three to 10 times as much as oral substitution treatment, depending on whether some costs components or the total treatment costs are accounted for (Strang et al., 2009). Unit costs of the Dutch injectable heroin programme were reported to be 12 times as expensive as a programme based on oral methadone (Dijkgraaf et al., 2005). This was mainly due to the need for new clinical premises and clinical supervision of patients injecting up to three times a day. The cost of injectable heroin, in particular, may be a prohibitive factor to commencing treatment and to long-term prescribing. Nonetheless, in all countries that have introduced heroin-assisted treatment, it is recognised that injectable maintenance drug treatment should be targeted at patients with high levels of need (EMCDDA, in press). Irrespective of treatment choice, health and social care systems would be likely to incur high levels of costs in providing for the needs of these clients.

Cost analysis and best practice

One of the barriers to the implementation of evidence-based interventions is the concern about possible costs increase (Eccles et al., 2000). The adoption of an evidence-based approach can be resource-intensive, especially if evaluation studies are performed (Guyatt et al., 2008). Conversely, evidence-based health decisions reduce the costs accrued by ineffective treatment and medications. In addition, the use of evidence-based care, over time, leads to improved client health and reduces further complications and need for treatment.

Treatment costs analyses may also facilitate sustainable choices in terms of best practice adoption and implementation. The Cochrane Library, a well-known source of evidence of effectiveness, contains a database of economic evaluations, including cost effectiveness evaluations of opioid substitution treatment with buprenorphine, buprenorphine-naloxone, and methadone, as well as evaluations of heroin-assisted treatment. No differences in terms of cost-effectiveness were observed between methadone and buprenorphine (with or without naloxone) (Doran, 2005); and the provision of methadone in prison was not more expensive than in the community (Warren et al., 2006). Methadone provision on a lifelong basis (consistent with the chronic disease approach) was studied with a multi-domain model finding an overall benefit for this treatment (Zarkin et al., 2005). While the above-mentioned studies were judged to have limitations, a study on co-prescription of heroin and methadone versus methadone only for maintenance treatment (Dijkgraaf et al., 2005) was considered appropriately performed and reported. To assess the value for money of the interventions, data from a randomised controlled trial conducted in the Netherlands (van den Brink et al., 2003) were analysed using a measure of disease burden that takes into account the quality and quantity of years lived. The analysis also incorporated the costs to society due to criminal activities, and concluded that co-prescribed heroin treatment produced a substantial cost saving.

Conclusions

This exploratory study illustrates the need both for the development of common approaches in studies of treatment costs and funding and for more countries to undertake research in this area. The national estimates that are available are difficult to compare, as each of them includes different elements; and making comparisons between different studies, even those carried out in the same country, can be challenging because of differences in methodology. A number of conclusions do emerge from this exploratory study. One of these is that labour appears to be a main cost component of substitution treatment, accounting for about half of the total expenditure. Staff costs differ between countries and in other forms of treatment they can be expected to represent different proportions of the overall cost. And, even within the same treatment modality, differences in therapeutic practices may result in different costs. This finding is important in highlighting the need to consider the national context and delivery practices when evaluating the cost-effectiveness of treatment modalities.

In Europe, drug treatment is financed mainly by public funding, though in a few countries social health insurance systems are important funders. Countries differ, however, in the levels of government at which funds are disbursed and managed. In the majority of the 13 Member States providing information, drug treatment is funded nationally, though local or regional funding is prominent in a number of countries. There is also variation within individual countries with regard to the organisation of financing for drug treatment.

In terms of unit costs (per person per day) across treatment modalities, there are clear differences between the treatment types. The highest unit costs are reported for inpatient modalities. The unit cost of inpatient psychosocial treatment is estimated to range from EUR 59 to EUR 404 per patient per day, with Sweden reporting the highest unit cost for this treatment. Detoxification carried out in inpatient settings is reported to cost between EUR 110 and EUR 303, with both the highest and the lowest estimates referring to treatment centres in the United Kingdom. Oral substitution treatment with methadone is reported to cost the least of the other treatment modalities, its unit cost ranging EUR 2 to about EUR 37 per patient per day, with the highest cost estimated in Norway. Although the unit costs of opioid substitution treatment are lower than those of the three other treatment modalities, due to the widespread use of this modality, the overall annual expenditure of reporting countries on opioid substitution treatment is higher than their annual expenditure for other treatment types.

The daily cost of substitution medication differs between countries by a factor of over seven. For both methadone and buprenorphine, the highest price was calculated for Finland. This was due to the high dose size reported in this country combined with the high price of the medications. In four of the five countries reporting price data for both medications, the cost of a daily dose of methadone was considerably lower than that of buprenorphine. Personnel costs — for wages, extra allowances, or management and administration — accounted for the greatest proportion of opioid substitution treatment costs. This is likely to be the case in other treatment modalities, and has been documented in the area of heroin-assisted treatment (with supervised injectable doses of pharmaceutical heroin) in Switzerland (Gutzwiller and Steffen, 2000). Knowledge about labour costs is relevant to resource planning and in exploring what options might be available for containing or minimising costs while maintaining effectiveness.

In attempting to answer questions about the costs associated with providing specialised drug treatment in Europe, this Selected issue encountered problems related to data quality and availability. In general, the data provided by Member States was of varying quality. To a large extent, this is due to the difficulty of retrieving comprehensive data from often complex funding streams. Potentially, the most useful sources of information include budgets and reports from national governments and local or regional authorities, which label expenditure according to the main areas of activity, including drug treatment. Few countries, however, were able to provide such data. Other problems included the paucity of data for certain areas of drug treatment and limited availability of disaggregated data. In addition, the cost data analysed here include data both from treatment studies and from cost studies. This is likely to have contributed to some of

the variability, as treatment delivered in a research context generally has a higher unit cost compared to routine treatment. In terms of the future, the development of a set of data collection instruments that are modality-specific and easy to use is a prerequisite for the gathering of comparable cost data within Europe.

Costs are influenced by resource use, thus it is unsurprising that the cost of treatment differs across the various treatment types. Treatment in inpatient settings should use more resources than that provided in outpatient settings. Opioid substitution treatment is cheaper than the other modalities on a unit cost basis, but the length of treatment may be open-ended. In addition, client populations utilising the different treatment modalities have varying drug use problems and health characteristics, requiring different levels of resources.

Meeting the challenge of containing cost, while ensuring that adequate access and quality of treatment are not compromised, is being explored via therapies delivered with a lesser degree of direct clinician involvement. A recent review (Newman et al., 2011) of computerised self-administered therapy and traditional therapies with various degrees of therapist involvement for drug addiction established the efficacy of self-administered and predominantly self-help computer-based cognitive and behavioural interventions, although some therapist contact was important for greater and more sustained outcomes. Innovative technology-based treatments are often cited as potentially low-cost alternatives, but this benefit is yet to be documented.

Similarly, addiction mutual-aid groups have the potential to help users recover from dependence at low cost. However, despite their long history (White, 2004) and wide use, relatively little controlled research has been conducted into the effectiveness of these groups, compared to other addiction treatments. Furthermore, of the existing research (for a review, see Humphreys, 2004), mostly conducted in the USA, the focus is almost exclusively on Alcoholics Anonymous and, to a lesser extent, on adaptations of their twelve-step programme, for example Narcotics Anonymous and Cocaine Anonymous. At a time of cuts in government spending across Europe, which may affect drug treatment budgets, insights are needed into the potential role of groups such as these in addiction treatment systems.

Finally, although it was beyond the scope of this Selected issue to explore what society receives in return for public expenditure on drug treatment, this information is needed to evaluate the cost–benefit relationship of drug treatment. European studies such as England's National Treatment Outcome Research Study (Gossop et al., 1998, 2000, 2003; Godfrey et al., 2004), Drug Treatment Outcome Research Study (Davies et al., 2009) and full economic evaluations of heroin-assisted treatment in Germany (von der Schulenburg and Claes, 2006), the Netherlands (Dijkgraaf et al., 1998) and Switzerland (Gutzwiller and Steffen, 2000) have examined treatment use and outcomes in these countries. When the costs of treatment in these and other studies are compared to the social benefits gained from treatment, including decreases in crime and costs of social care and healthcare, the findings are unvarying: treatment is cost-beneficial from the societal perspective.

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([5]) Hyperlinks to online sources can be found in the PDF version of this publication, available on the EMCDDA website (http://www.emcdda.europa.eu/publications/selected-issues/treatment-costs).

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