12. Mortality related to drug use: a comprehensive approach and public health implications

12.1. Introduction

Achieving a reduction in mortality from overdoses of illegal substances or of non-prescribed medical treatments remains a major public health challenge in France, as stated once again in the 2008-2011 plan presented by the *Mission interministérielle de lutte contre les drogues et la toxicomanie* (Interministerial Mission to Fight against Drugs and Drug Addiction or "MILDT"). Waging a more effective fight against this phenomenon requires regularly updated knowledge of the latest trends, and therefore the availability of effective measurement tools. On this particular point, the situation may appear somewhat paradoxical: there are several official sources providing records of deaths related to overdoses by illegal substances, but these continue to be hampered by the suspicion of under-recording (Lecomte et al. 1994; Lepère et al. 2001; Janssen, E. 2010). These sources, the estimated levels in addition to the methodological limitations, have already been extensively described in the various national reports submitted to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA). The question as to their validity has become a particularly acute one due to the increasing number of overdoses recorded since 2003.

The creation of cohorts of users and their monitoring over the long-term (i.e. several years), offers an alternative and supplementary approach vis-à-vis these records which supply transversal data. The higher mortality levels found among drug users in France when compared to those of the general population have been the subject of several studies (Gremy et al. 1997; Lopez et al. 2004). In France, we currently only have access to the results of a retrospective survey carried out in the early 2000s. Several recommendations have been made by the scientific, public health and epidemiological communities for the creation of a prospective cohort study. In order to meet this twofold need, the OFDT has launched a study meeting the requests of the EMCDDA and drawing upon the network of treatment centres for drug users and low threshold or harm reduction centres.

The causes of death among users of psychoactive substances are not limited to overdoses alone. The sharing of the equipment used to take such substances (syringes, water, straws, etc.) remains one of the leading factors behind the circulation of fatal diseases such as AIDS and hepatitis. Specific registers exist, providing information about the changes noted during the last two decades.

12.2. Recent follow up mortality cohort studies among PDUs

12.2.1. Retrospective study of heroin, cocaine and crack users

In France, we currently only have access to a single finalised cohort study, for which the results have been published. This was carried out by the OFDT, working with the police via the *Office central de répression des traffics Illicites de stupéfiants* (Central Office for the Repression of Drug-Related Offences or "OCRTIS"), based on a retrospective cohort study of drug users arrested by the police (Lopez et al. 2004)[115].

This study comprised a total of 42,500 individuals born in France and arrested in 1992, 1993, 1996 or 1997 for the use or use of heroin, cocaine or crack and persons arrested for the use or use of cannabis. A third group of individuals arrested for the use of ecstasy was also created,

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[115] For further details, go to: http://www.ofdt.fr/BDD/publications/docs/eftadlk5.pdf for the English version.

although the low numbers of people involved did not allow for a reliable analysis of mortality levels. Statistical analysis was only possible for those persons arrested for the use/dealing of heroin, cocaine and crack.

The cohort of individuals arrested for the use of heroin/cocaine/crack included approximately 23,000 people, 82% of whom were male, with an average age of 27. Just over 70% were unemployed or with no stated profession. They tended to be more numerous in the regions of northern and north-eastern France and the Mediterranean rim. Most of the individuals in this group (52%) had been arrested more than once. Following the comparison of databases, 1,016 deaths of members of this cohort were recorded between 1992 and 2001. Among these deaths, 609 causes (coded based on the ICD9 rules) were documented. The 407 remaining deaths could not be categorised at the time the data was analysed.

Over the whole observation period, the gross mortality rate stood at 7.3 deaths per thousand person-years (PY). The mortality rate among the persons arrested logically increases with the age at the time of arrest (3.8 per thousand PY for those under 25 vs. 17.9 among the 45-59-year-olds) and is higher among men than among women (7.7 per thousand PY vs. 5.3). The gross mortality rates declined sharply over the observation period. Calculated over the four years following the arrest, the mortality rate of persons arrested for heroin/cocaine/crack use in 1996/1997 was almost half that for persons arrested in 1992/1993 (on average 6.2 per thousand PY compared to 10.3 per thousand PY). Standardised data makes it possible to compare data from the cohort with that of the French population. At an equal age, men arrested for the use of heroin, cocaine or crack have a risk of death five times higher than the average French male. For the women arrested, the risk vis-à-vis the French female population as a whole is higher than nine.

The standardised mortality ratios broken down according to the immediate cause are shown in the table below:

Table 12-1: SMR by cause of death and by gender: cohort of persons arrested for heroin, cocaine or crack use (1992-1999).

Causes	Men	Women
Infectious and parasitic illnesses	22.0***	23.2***
Including known AIDS and HIV infection	24.0***	28.7***
Tumours	2.3**	3.2*
Mental problems	42.6***	139.9***
Incl. drug dependence	102.7***	677.4***
Diseases of the nervous system and sensory organs	1.5	-
Diseases of the circulatory system	3.5***	12.9***
Diseases of the respiratory system	5.1**	5.9
Diseases of the digestive system	4.9***	14.5**
External causes of trauma and poisoning	4.1***	10.2***
Including traffic accidents	3.1***	5.4**
Accidental intoxication	26.2***	-
Other accidents and after-effects	10.0***	22.7**
Suicides	3.5***	12.6***
Homicides	10.7***	-
Poorly defined symptoms, signs and morbidity	12.0***	34.9***

Benchmark year: 1997, 15-54 years old. *** $p<0.001$; ** $p<0.01$; * $p<0.05$. Source: Lopez et al. 2004.

The deaths of persons arrested for heroin, cocaine or crack use for whom the causes of death are known can be broken down as follows: 20% for death by overdose directly related to drug use, 13% for death by AIDS, just over a third for death by external causes of trauma and poisoning (including 10% due to traffic accidents and 11% to suicides), leaving a fifth of deaths for which the cause is unknown. The remaining 15% include deaths by tumours and diseases of the circulatory, respiratory and digestive systems.

This study suffers from several important limitations. The first is that it is focused on a particular type of user, who is likely to have been arrested by the law enforcement agencies. This restricted population group only corresponds to a certain user profile, for which we lack information pertaining to use (frequency and administration methods). The second corresponds to a hypothesis of custody on the grounds of drug use. However, in practice it is known that law enforcement agencies tend to use illegal substance use as grounds for detention, as this tends to be easier to prove than illegal narcotics dealing. A third limitation addresses the failures among the databases, concerning 11% of the individuals being monitored.

12.2.2. The prospective cohort study of user health/mortality

The creation of a prospective cohort study of users of illegal substances remains the only valid solution if we are to be able to estimate mortality risks (through a quantitative approach) and the causes of death (through a qualitative approach). This solution, the organisation of which is methodologically complicated and very costly, has so far not been adopted in France.

In order to avoid this problem, the prospective cohort study is based on the participation of treatment centres issuing specialised care to drug addicts, which have become widespread with the development of the harm reduction policy. This choice offers a number of major advantages including a wider panel of subjects and a more diverse sample of the user population, specially trained staff fully experienced in the reality out in the field, in addition to an established network

familiar with requests for information. The next step was to constitute an information source recording the centres' activities. Such a scheme exists in France: this is the *Recueil Commun des Addictions et Prises en charge* (Common data collection on addictions and treatments), an application of the TDI protocol in France organised since 2005 by the OFDT (Palle et al. 2007a). It lists all individuals receiving treatment for addiction via the *Centres de soins spécialisés en toxicomanie* (Outpatient specialised drug addiction treatment or "CSSTs") and the *Centres de cures ambulatoires en alcoologie* (Alcohol Outpatient Cure Centres or "CCAAs"), which have been grouped together since 2007 under the title *Centres de soins d'accompagnement et de prévention en addictologie* (Centres for Treatment, Assistance and Prevention of Addiction or "CSAPAs", as part of the 2007-2011 government plan for the treatment and prevention of addictions). Finally, the CAARUD (*Centres d'accueil et d'accompagnement à la réduction des risques pour usagers de drogues* or Reception and harm reduction support centres for drug users), which include the low threshold centres, are in permanent contact with active users, and particularly the most vulnerable, who are not seen by the treatment centres. The financing of their activities by the Social Security system, which began in 2005, has been accompanied by an obligation to carry out a survey, the ENa-CAARUD, which was organised for the first time in 2006 under the responsibility of the OFDT (Toufik, A. et al. 2008a). The questionnaire completed as part of this survey is a modified version of the RECAP questionnaire, which is also used for the CAARUDs' bi-annual survey. In addition to the socio-demographic characteristics (age, sex, educational level, profession, source of income, etc.), the questionnaire also gathers details of drug use (types, frequency, methods, etc.) and the general state of health of the drug users[116].

The inclusion criteria are defined as any individual in contact with a low threshold structure or having started a course of treatment in a treatment centre for the use of one or several illegal substances (to the exclusion of cannabis when this is the only problem drug) or an opioid substitution treatment when this is outside the scope of medical supervision. These individuals can be both minors and adults, regardless of the substance concerned, the method for initiating treatment (voluntary, spontaneous, or at the request of a third party), or the number of possible previous treatments undertaken. For identification purposes in the registers concerned, the individuals must be of French nationality or a beneficiary of the French social security scheme.

The various centres participate on a voluntary basis, with certain centres refusing the abandonment of anonymity required in order to track the health status of the users concerned. Although the previously described retrospective cohort study was based on police data, which obligatorily includes named data, the last names, first names, dates and places of birth must be supplied by individuals agreeing to participate in this prospective cohort study. This is a particularly sensitive subject among the community of individuals involved in the drug addiction field, and their wholehearted commitment to the project is required in order to ensure that users are fully informed. To date, 97 centres have officially agreed to participate in the study.

## 12.3. Complementary sources with drug-related mortality information

Death by illness (HIV and hepatitis)
No specific monitoring or information systems exist in France with regard to the death of drug users through infectious diseases (AIDS or hepatitis C). However, a national HIV/AIDS monitoring system is in place (see Appendix V-T), coordinated by the *Institut de veille sanitaire* (the national health watch institute or "InVS"), based on the compulsory requirement to declare AIDS cases (incumbent upon all clinical practitioners since 1986) and cases of HIV infection (compulsory since 2003).

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[116] For further methodological details and to view the questionnaire, go to: http://www.ofdt.fr/ofdtdev/live/reserve/cohorte2009.html

The purpose of these announcements is to describe the population of HIV positive individuals or AIDS sufferers in order to be able to track the infection dynamics in order to better adapt preventive action. Consequently, this system makes it possible to obtain information according to the contamination method of the subjects concerned. In particular, it is possible to obtain annual data concerning the number of AIDS deaths among intravenous drug users (Graph 12-1).

Graph 12-1: Number of new AIDS cases declared among intravenous drug users.
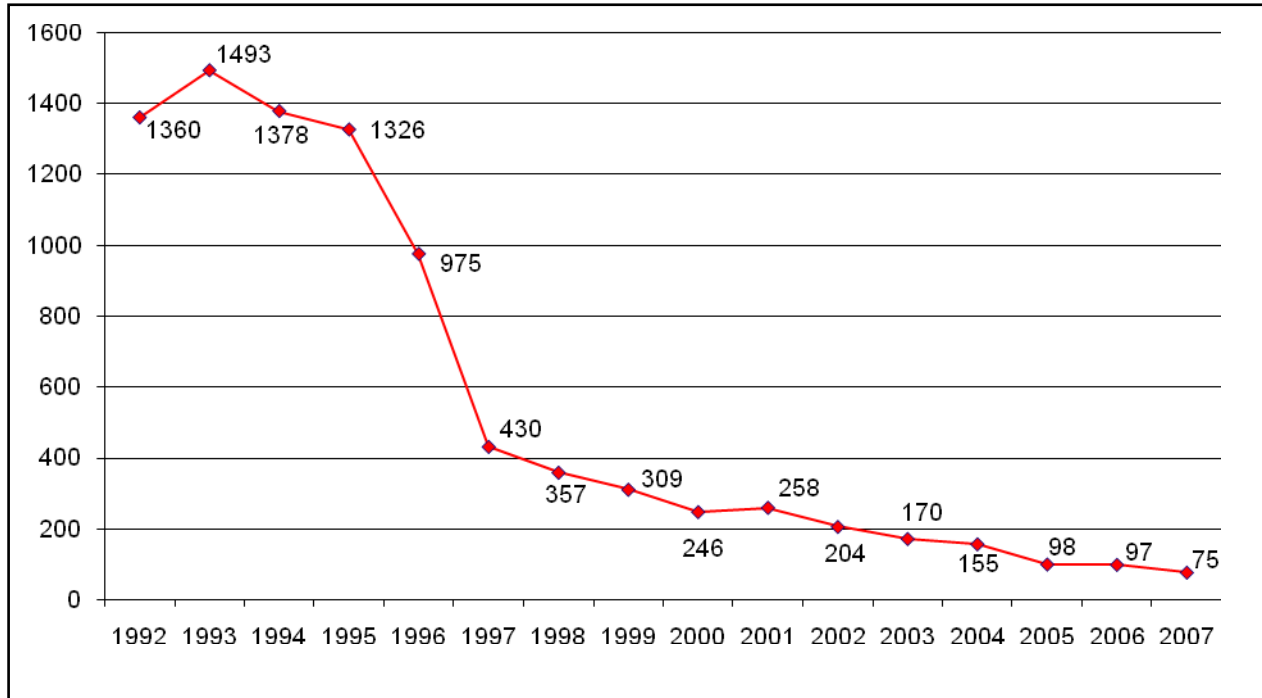
Source: InVS.

AIDS deaths among intravenous drug users are shown in Graph 12-2. A downward trend in the number of deaths linked to intravenous contamination began in the mid-1990s and has continued at a slower pace since 1999. In 2007, just under 50 deaths through AIDS were recorded. Deaths among intravenous drug users nevertheless accounted for 20% of all AIDS deaths in 2007.

163

Graph 12-2: Number of AIDS deaths among intravenous drug users
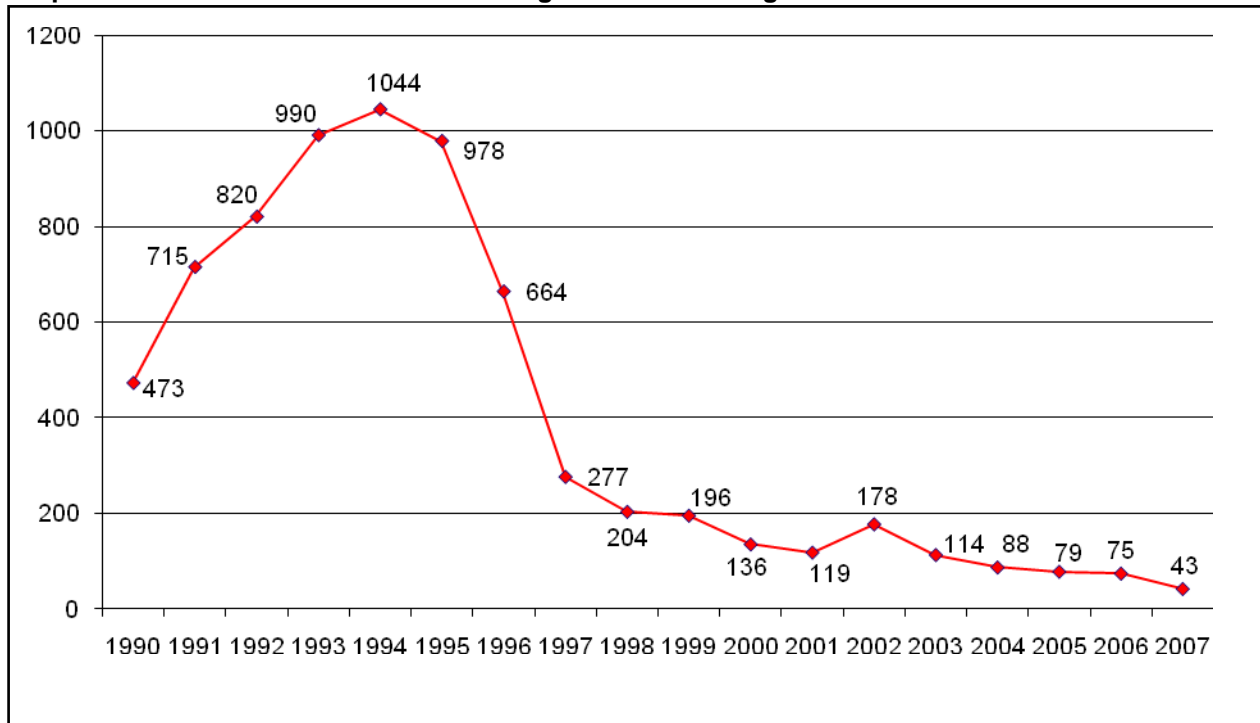
Source: InVS.

The general mortality register maintained by the *Centre d'épidémiologie sur les causes médicales de décès* (the Inserm's centre of epidemiology for medical causes of death or *CépiDC*) is a national database of the medical causes of death, compiled on an annual basis from information supplied by the death certificates issued by doctors. This information is coded in accordance with the International classification of diseases (ICD), the rules for which make it possible to select the initial cause of death, based on which the "cause of death" statistics are issued on an annual basis. Hepatitis C is covered by three separate categories *(B17.1: acute hepatitis C, B18.2: chronic viral hepatitis C, B19: unspecified viral hepatitis)*. Cases of HIV or AIDS are covered by the categories *B20 to B24*, according to the infectious diseases, malign tumours or other infections to which HIV can give rise. Although this information system can provide an overall estimate of annual deaths due to HIV or AIDS, it is not however able to specify the percentage of deaths related to intravenous infection with regard to this total. Indeed, mentioning the use of a drug is neither automatic nor compulsory and the decision as to whether to include such information is made exclusively by the GP completing the death certificate.

12.4. Public health perspectives

Three information sources concerning deaths through drug use are available in France. These are the database of the medical causes of death maintained by the general mortality register (CépiDc); the OCRTIS database; the *Décès en relation aux abus de médicaments et de substances* database (DRAMES - Deaths in relation to the abuse of medicines and drugs) from the *Agence française de sécurité sanitaire des produits de santé* (French Health Products Safety Agency or "AFSSAPS"). Their data is shown in table 2.

Table 12-2: Deaths by overdoses in France according to 3 sources.

Year	OCRTIS	CépiDc (selection B)		DRAMES
		All	15-64 y.o.	
2000	120	248	225	101
2001	107	274	243	n.av
2002	97	244	225	74
2003	89	233	212	64
2004	69	268	239	86
2005	57	303	264	68
2006	n.av.	305	275	168
2007	93	333	287	192
2008	n.av.	374	322	217

N.av: not available. Sources: OCRTIS, DRAMES, CépiDc, various reports.

The DRAMES data does not make it possible to identify a clear trend, with the increasing overdoses noted in 2006 being explained by the increasing number of forensic organisations and laboratories taking part in the data collection campaign. This number has remained generally constant since this date, leading us to conclude that there was an upward surge in the number of deaths by overdose between 2006 and 2008.

The profile of the persons dying as a result of an overdose is drawn up based on the data from the CépiDC (applying selection B). This population group is limited to 15-64-year-olds. Fatal overdoses tend to be a masculine trait, with a sex ratio of around five (this ratio is approximately 4 for users receiving treatment). The percentage accounted for by women has fallen over these eight years. The average age of death is higher among women (36.8 years old) than among men (33.4 years old). Gender differences tend to concern the types of drugs having led to the death. Among the men, two-thirds of deaths arose as a result of behavioural problems related to the use of several drugs. Among the women, the percentage of such deaths only accounts for half of the total, with the percentage of accidental overdoses or suicides being higher. More than half (52%) of users were economically inactive at the time of their death, while 43% had a job and the situation of the remaining 5% was unknown. The deceased tend to be of a modest socio-economic level. Among those deceased whose employment status was known, more than half were workers (53%) and more than a third were office workers or involved in the intermediate professions (36%). These are followed by self-employed professionals and executive staff (6%), craftsmen and shopkeepers (5%) and farmers (1 %).

12.4.1. The main causes of death

Most of the overdoses through behavioural problems recorded in the mortality register are listed in the "poly-drug use" section. This reflects both the method of use prevailing among drug users, but also the difficulty in accurately identifying the products from death certificates.

The DRAMES supplies valuable information concerning the drugs used, insofar as this is based entirely on the results of toxicological analyses. In 2008 (table 3), illegal substances were involved (as the main product) in just over half of the cases (52%), substitution treatments in almost 39% of cases and opioid medicines (non-substitution) in almost 9% of cases. Overall, opioids are chiefly involved in 84% of cases and cocaine (alone or combined with other products) in approximately 14%. Between 2006 and 2008, the increasing number of overdoses

is chiefly explained by the rising number of people dying as a result of overdoses of heroin (+20 cases), and methadone (+32 cases).

Table 12-3: The main substances involved in overdose deaths in 2007-2008 (DRAMES data).

	2006		2007		2008	
	N	%	N	%	N	%
Heroin alone or combined with other products	59	35.1	69	35.9	79	36.4
Cocaine alone or combined with other products	31	18.5	39	20.3	30	13.8
Other illegal substances (alone or combined)	5	3.0	2	1.0	4	1.8
Methadone alone or combined with other products	31	18.5	61	31.8	63	29.0
Buprenorphine alone or combined with other products	20	11.9	11	5.7	21	9.7
Other opioid medicines, alone or combined	18	10.7	10	5.2	19	8.8
Others	4	2.4	0	0.0	1	0.5
Total	168	100.0	192	100.0	217	100.0
Number of departments taking part	16		18		19	

Source: AFSSAPS. Only deaths directly caused by drug use are mentioned.

12.4.2. The main risks

The rise in the number of deaths through overdoses in the second half of the 2000s can be explained by the appearance of new, younger users associated with the festive environment, whose use frequency tends to be more irregular and who are relatively unknown to the treatment centres. Less aware of harm reduction messages, their limited experience and lack of knowledge of the substances concerned and their chosen methods of use tend to result in higher-risk behaviour.

The growing use of cocaine and other stimulants since the early 2000s in addition to the increased availability of heroin, (the retail price of which has fallen and which today has a somewhat less negative reputation among users than was the case a decade ago) are further explanations for this trend. Intravenous injection practices have changed as a result of the risk reduction policy. However, this is a growing usage method among users of cocaine, ecstasy and amphetamines. We should also note the appearance of the intramuscular injection of HDB (Cadet-Taïrou, A. et al. 2010a).

A number of professionals have highlighted the emergence of a new relationship between harm reduction policies and repressive policies over recent years (Cadet-Taïrou, A. et al. 2010a). Tighter controls and a greater willingness to jail offenders should be viewed in light of the appearance of newer, riskier and more spontaneous uses. A number of centres have also reported difficulties in maintaining contact with certain categories of users, particularly those with the most precarious lifestyles.

12.4.3. Priority areas

Bringing about a reduction in the number of fatal overdoses in France remains one of the priorities in the various anti-addiction plans. The latest three-year plan (2008-2011) from the *Mission Interministérielle de lutte contre les drogues et la toxicomanie* once again specifically

mentions this[117], although no specific strategy is indicated: achieving a reduction in mortality caused by drug use should be brought about by reducing the drug use itself.

Field activities aimed at reducing mortality caused by drug use are being carried out by harm reduction associations, often subsidised by public funds, although in practice, these are not coordinated by the state. The work carried out by these organisations is neither coordinated nor synchronised. Furthermore, no "best practices" guide exists.

12.5. Conclusion

Reducing mortality levels among users of narcotics or non-prescribed medicines is a recurrent health and political theme, without there being any specifically targeted measures. A reduction in mortality must be achieved through a reduction in uses.

Three surveys take stock of fatal overdoses in France while two other databases record deaths of drug users through AIDS and hepatitis. The underestimation of the number of fatal overdoses continues to pose a serious problem even if the corrected estimates remain below the levels seen in neighbouring countries (the UK and Germany). Despite these problems, all three sources confirm an increasing number of fatal overdoses in France since the mid-2000s. The greater availability of stimulants, (particularly cocaine and ecstasy), the persistence of injection as an administration method, the falling price of heroin and the appearance of new types of users who are less aware of harm reduction measures are just some of the explanations put forward for this phenomenon.

An initial retrospective cohort study including individuals arrested for the use of certain narcotics has made it possible to quantify the excess mortality characteristic of drug users. A second, prospective survey is based on users receiving treatment or visiting harm reduction centres. Non-fatal overdoses are also receiving greater attention (Fairbairn et al. 2008), even if very little data is currently available in France (Cadet-Taïrou, A. et al. 2010a). The various aspects of this theme are specifically analysed in the cohort study underway.

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[117] http://www.drogues.gouv.fr/site-professionnel/plan-gouvernemental/plan-gouvernemental-20082011/