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# EPIDEMIOLOGY OF DRUG RELATED DEATHS IN EUROPE:

# RESEARCH ISSUES AND PREVENTIVE IMPLICATIONS.

## FINAL REPORT

**Study for the Commission**
**of the European Communities**

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# EPIDEMIOLOGY OF DRUG RELATED DEATHS IN EUROPE:

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## I. Introduction.

We present here the main results which have been discussed during the course of the study and during the Paris expert meeting which occured in October 25-26.

The expert meeting concerning the epidemiological study of deaths related to illicit drug use reflected the general concerns of policy-makers and researchers in each of the participating European countries. In our questionnaire to the experts prior to the meeting, we had defined the scope of the study as follows:

1) How reliable and how valid are the procedures for compiling statistics ?

2) Are definitions and statistical procedures identical in the 12 European states ?

3) What would seem to be the significance of the data already collected ?

4) What can be done to improve the quality and relevance of the drug-related deaths "indicators" ?

Deaths related to illicit drug-use were defined in this questionnaire as deaths resulting directly or indirectly from illicit drug-use. Not all of these deaths would be currently registered as drug-related. Some deaths would be regarded as directly drug-related, typically overdose deaths. Others would be regarded as indirectly drug-related, even though they would not be registered as such, since causal links could not always be established between the death itself and drug-use: typical examples were accidents, suicides and homicides occuring in the course of, or during recovery from, significant intoxication.

This definition may not have reflected the member countries' current definitions, but was chosen to identify the possible points of comparison between the countries, and the bases on which new choices could be made for the classification of drug related deaths.

## II. Methodology.

### 1. The choice of experts.

For the choice of the experts, a national correspondent for this study had been nominated by each member state. The national correspondent helped us to identify the experts who would directly participate in the study.

2. The pre-study

The Scientific Committee helped us to identify and gather the main research which had been conducted in the area of drug related death. Each National Correspondent was visited by IREP in order to prepare the data collection and interpretation.
A questionnaire was designed with the contributions of the Scientific Committee. This very detailed questionnaire was discussed with each National Correspondent.

3. The Sevilla Group.

As part of the coordination task, IREP participated in the October meeting of the Sevilla Group, and presented the methodological aspects of the study. Although the two projects are distinct, the information exchange between the groups was considered as very useful. A member of the Sevilla Group, Dr Maravelias, was also invited to give a contribution at our expert meeting.

4. Organization of the meeting.

The expert meeting in Paris on October 25/26, 1991, was organized such that the experts could present their country's situation, and that there would also be the time for an open discussion. A meeting of two days was considered necessary for this purpose. The experts' presentations and the discussion would be followed by a meeting of the Scientific Advisory Committee to discuss the preparation of the final report, and the conclusions reached.

**III. The Paris meeting.**

At the meeting, the experts presented the current definitions of drug related deaths of their countries, as well as the procedures of data collection and analysis. They also offered valuable insights on reaching corresponding definitions and comparable data bases on a European level in the general discussion on possible developments towards a European coordination of studies on drug related deaths.
First, the presentations of the National Experts will be resumed.

**1. Ireland.**

Dr Aileen O'Hare (Ireland): The Irish government would favor a broad definition of deaths arising from licit and illicit drug use, as well as a nationally employed indicator of such deaths. The currently available sources include: the records of the Statistical Office, of the police, the coroners' records, records of drug related AIDS deaths, and of several small studies conducted in this area. For the present task of national and international coordination, however, none of these records are adequate. As an encompassing definition, "Deaths under suspicious circumstances" is proposed to contain all possible cases of drug

related deaths. Presently, because of the legal situation- suicide, for example, remains a criminal offence - deaths with possible drug involvement are redefined in order not to be further investigated by the coroner.

Dr O'Hare gave an example of the present procedure: when the coroner suspects an unnatural death and orders a post-mortem, and other than natural causes of death are revealed, he must do an inquest. Pertinent evidence is sought from eye-witnesses and from doctors. ICD forms E 71 and 104 have to be completed to answer to whether the death was accidental, suicidal, homicidal, or undetermined. From the coroner, the report goes to the registrar of births and deaths, where the international certificate is completed. In the case of suicide, additional forms are completed.

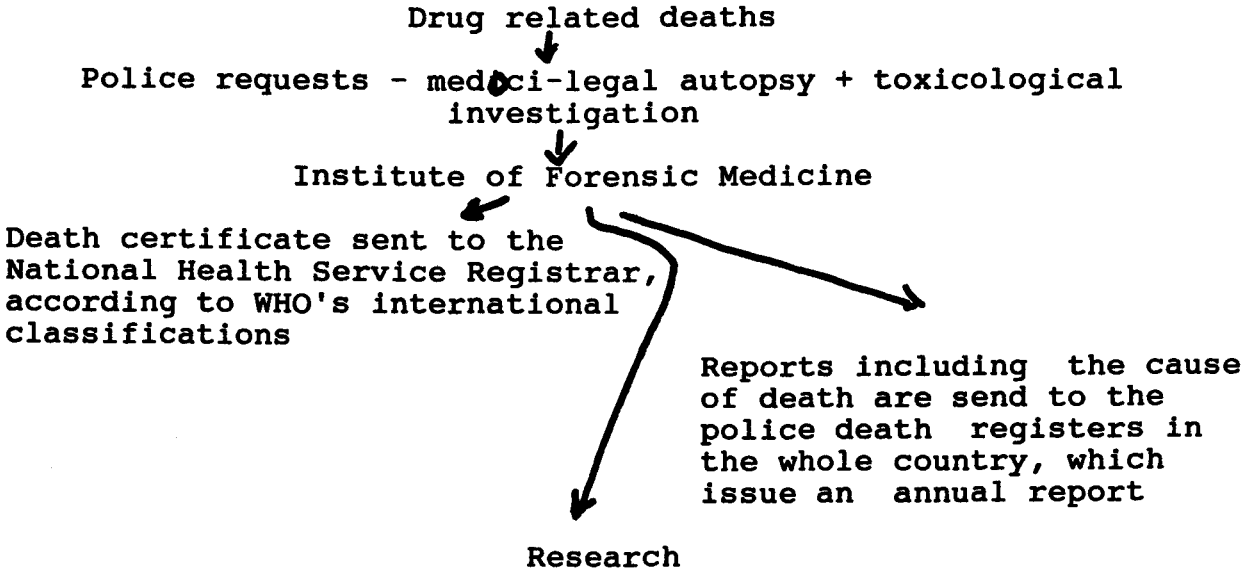
These forms provide the basis for the mortality statistics. Other documents include form C 71, and reports of the coroner's idea of what the cause of death might have been, as specified by the ICD forms. Such data exist from 1967 onwards.

The Central Statistical Office (CSO) is also willing to supply information on drug related deaths, yet there are no statistical or otherwise comprehensive data. In the Dublin are, 3000 to 4000 coroner's inquests were conducted. Other accessible data include those of a study near completion, of a group of - in the original cohort- 160 opiate users (injectors) in a deprived Dublin area. Of this group, 65% were tested, and 85% were found HIV-positive. Furthermore obtainable are data on mortality cases of AIDS-related diseases.

Dr O'Hare proposed that the coroner's records for the Dublin are should be examined for the same period as the records of the CSO. Furthermore, the guardee's definitions and criteria used to determine drug related deaths should be examined. It should be decided which ICD codes will be used, and whether licit drugs (barbiturates) will be included as well.

**2. Denmark.**

Dr Anni Steentoft ( Denmark): The Danish government circular of 22 October 1970 defines drug related deaths as "Deaths related to the abuse of narcotic drugs, which have to be subjected to medico-legal autopsy and toxicological investigation". (In 1968, the first drug related death had been recorded in Denmark). Drug related deaths have to be recorded at the Central Office of Forensic Medicine. In a study of deaths in a 12 year period, Dr Steentoft found that only 8% of these deaths did not come to the attention of Forensic Medicine, namely the deaths in hospitals. It can thus be concluded that the system is quite satisfactory. In a schematic presentation:




The police reports supply the best information about drug related deaths. The definitions the police uses in their registers are :
a) the abuse of substances as listed in the Single Conventions,
b) the use/abuse of other drugs, of users known to the police,
c) other substances than those listed as in (a), to include euphoria.

The statistics for drug related deaths show an expected increase for 1991. The ratio of 80% male / 20% female has remained more or less constant, while the average age has increased from 19 years in 1969 to 32 years in 1990.

Since six years, there has been a cooperation between the five Nordic countries (Denmark, Sweden, Norway, Finland, Iceland). Dr Steentoft conducted a comparative study to establish a register of actual drug related deaths, that is, not including medicine abuse. The definition of drug abusers is similar to the one used by the police. In a comparative table of fatal intoxication, drug related deaths occur about three times more often in Denmark than in Norway, five times more often than in Sweden; few are listed in Finland, and none in Iceland for the period of 1984 and 1985. This table concerns fatal intoxication in the age group 15 to 34 years.

A new study for this year considers all age groups, and all causes of death. A broad screening procedure is to yield information on the mixed use of drugs to find out what combinations are used by addicts. Why could a similar study not be conducted in the 12 member states, since it has been possible among the five Nordic countries ? A precondition is the legal procedure, that the police has to order an inquest - this is why the statistics are complete.

In the discussion, questions were raised about the police definitions, whether they would not exclude large numbers of

indirect drug related deths, as in traffic accidents. Also, drug users -for example, upper class- could be missed who would not fir the police description of addicts.

Asked about the police's definition, Dr Steentoft replied that the police has the possibility to adapt and modify their definition as a basis for their evaluation through discussions with the Institute of Forensic Medicine, and that they are also in contact with the family of the deceased in a drug related case.

### 3. Italy.

Dr Alexandra de Rose (Italy): The classification of drug related deaths poses some problems, since some were registered in the group of psychis diseases; furthermore, the distinction of directly caused deaths is difficult.

In a report on statistical data, Dr de Rose stated that there is an increase in drug related deaths since 1988 of 49 %. The average age has been rising, and there is an increasing incolvement of cocaine. There are no published statistical data because of a lack of legislation on such publication; the police has data, however, their classifications differ from those employed by the Ministry of Interior Affairs.

Accidents related to alcohol or drugs, concerning drivers or pedestrians, are difficult to register. In hospitals, drug related deaths might be registered as accident traumas, and not screened for involvement of drugs.

As the number of HIV-cases increases, a further increase of drug related deaths is expected. In the regions of Italy, there are very different situations (see table). The most frequent cause of death in drug related cases are overdoses, but there is a lack of definitions of other causes.

Data are collected by the Ministry of Health, but the data do not cover the total population of drug abusers, which is assumably larger than those who attend the treatment centers for drug addiction. An epidemiological study of special interest is that of a group of drug users enrolled in methadone programs between 1980 and 1988.

A new European observatory is expected to be a reference point on drug addiction and on related processes.

### 4. United Kingdom.

Dr Patricia Dowdeswell (United Kingdom): Three phases can be distinguished in the availability of data:

1. pre-1991: - very limited information is available
   - the national information did not include all drug related cases
   - more detailed information is available for special studies, but these studies are restricted to particular areas, or special groups of people.

2. 1991: more detailed information has been published on a national level, with a more comprehensive, but also very wide definition of drug related deaths

3. onwards: a more precise definition of drug related deaths will be employed.

Current information is derived from a national register on drug related deaths, and from follow-up studies of -mostly opiate-addicts.

Death registration is as follows:

1. When death occurs,
   - if it is natural, it is registered by doctors
   - if unnatural (drug related), the case is referred to the coroner (in England, Wales, and Northern Ireland), or to the procurator (in Scotland)

2. The inquest held by the coroner or procurator is likely to involve a post mortem, but not necessarily a screening for drugs.

3. The registration of cases of death

4. The coding of death cases according to ICD codes.

There are 160 coroners, who all have different practices; it is their decision as to what was the cause of death.

According to the definition of drug deaths (as in ICD 304), deaths from the non-dependent use of drugs exclude alcohol and tobacco. There is a national survey system for AIDS and HIV-related causes of death.

In focusing on deaths directly related to drug use, some deaths will be included which are not related to illicit drug use. There is a poor coverage of deaths indirectly related to drug use.

In a study of addicts' deaths, as obtained though the National Health Service Central Register, information was obtained from doctors, coroners, police, and newspapers. Drug related deaths were checked against an index of opiate addicts. Commenting on this study, it appears that some deaths may be missed, and that death cases will be restricted to opiate addicts who have contacted a doctor. There is no check whether they are still addicted at the time of death.

Not all suicides are screened; but in Hamburg, because of the special interest, also all accidents are screened.

According to the police definition, if there is a record of drug addiction, it is a case of drug death. In case of a traffic accident, death causes are attributed to drugs when found.

### 6. Greece.

Dr Dimosthénis Boukis (Greece): The Ministry of Public Order (the Police Dept.) receives reports from the police stations. For a burial licence, it is necessary to go through the police.

Forensic Services (Ministry of Justice and Education)

Police stations

Ministry of Public Order

Registration: National Statistics Service

The number of deaths from police stations all over the country are registered. Tables show that heroin figures higher than other drugs in the analysis of causes of death. The main group of drug deaths is between 21 to 30 years, male, single, from the region of Attica, with lower education, and unemployed.

The forms used are the medical reports of death filled out by the physician. The certificate of death is reported to the Statistical Service. In analyzing the data from the Statistics Office, prior to 1979, no drug deaths are reported, and afterwards, only a few cases. A problem seems to be that the confirmation of the medical report comes 30 days later. Furthermore, in the case of long-term hospitalization, there are multi-factors of death. Thus, cases of drug deaths are lost, and the level of the reported data is not reliable.
What is needed is a coordinating office to collect all the data from the different institutions involved. The question is, how to take advantage of the focal point of the police stations, as part of the preventive effort. Pamphlets on prevention could be distributed at the police stations, so that each citizen can contribute to reporting drug involvement in deaths, without associating this with denouncement. In most cases, drug dependency is dropped as a death cause. There is a strong social stigma attached to drug death. In a neighborhood case of drug death, all signs of evidence of drug use are removed.
A similar problem exists with the AIDS register; ca. 35% of the cases are not registered under AIDS.

## 7. Belgium.

Dr Bernard Vandenbosch (Belgium): There are two ways of registering drug related deaths: through the police services, and through the National Institute for Statistics of the Ministry of Economics; the latter records a higher number of unnatural deaths. The police services collect only data of deaths in public places, and in private homes when they require police intervention. The death certificates of doctors -which go to the Institute for Statistics- include the cases in which the police is concerned.

Problems for determining drug deaths arise from the knowledge of doctors to differentiate between substances of abuse, and from the unclear definition of drug overdose.

The death certificate must be delivered very quickly, therefore, important information is often not conveyed. It is recommendable that, in a second step, an account of the case should be added; this would mean to design a document where a part can be filled in later.

Another problem is that the family of the deceased convinces the doctor to put another cause of death on the certificate.
Data should also be analyzed better, concerning cocktails of medicines involved, and as to the causes of death. An inquest is held only on demand, by the doctor or by the family.

## 8. France.

Kassem Khaldi (France): Statistics on drug deaths are assembled by OCRTIS (Ministry of Interior) from customs, the army, and the police. Drug addicts are found dead mostly in public places, mostly due to overdoses. Evidence is established through signs of injection drug use related paraphernalia. The judge may ask to conduct an autopsy of a person found dead in a public place, especially if there is a criminal record. Unfortunately, no statistics are assembled from these reports.

INSERM (National Institute on Medical Research) registers all deaths occuring in France, no matter what their cause is.
First results of an analysis of police records show that there were 29.000 interventions in 1990 in connection with drugs, and that there has been an increase every year of deaths due to overdose, or to drug related accidents (from 237 cases in 1984, to 350 cases in 1990). Heroin is the main product to cause death, prescription drugs constitute the second cause.

To elaborate the hypotheses on drug related deaths, an ethnographic study has been started by IREP, which allows us to understand the qualitative factors involved. In retrospective case studies, Dr Rodolphe Ingold and Mohamed Toussirt discerned as cause of death overdose in one third to one half of the

cases; further causes were suicide, violent deaths by accident or homicide, and AIDS.

The ethnographic study includes interviewing active i.v. drug users in the streets. One ex-addict who used heroin for 20 years, from 1970 to 1990, was asked to talk about the drug users he knew during that time, to gather a qualitative description of mortality. In more than 50% of the cases of drug deaths, there seem to be other causes involved as well.

There are no national guidelines concerning overdoses, autopsies are not performed on a general level. The distinction between overdose, suicide, or accident is not always clear. The Ministry of Health is trying to extract from INSERM data those cases which could be drug-related, for further analysis. As for now, there are almost only data available from the police; it would be important to get data from all the other institutions who might be involved (for example, from poison centers).

To determine the cause of death, and whether an autopsy will be performed, is left to the coroner's judgment; the police is not involved in the certificate of death.

**9. Netherlands.**

Dr Giel van Brussel (Netherlands): The mortality among drug users is rising sharply in the city of Amsterdam because of AIDS. From the treatment field, data are also collected concerning the health situation of drug users, which can help us to understand factors related to drug deaths.

The methadone buses supply approximately 4000 addicts. Since 1984, needle exchange has been possible. There are about exchanges per day. Health care is provided by the Municipal Services (GG&GD), and also by different programs dealing directly with active drug abuse. 1200 persons are enrolled in different programs. All methadone given out is registered.

Tables show the number of addicts, their age, the number of needles exchanged, and the deaths after overdose in Amsterdam. The average addiction career is lengthening, to between 10 and 15 years. The pathology is different now: formerly mostly acute through overdose or accidents, now the causes are intercurrent bacterial infections preceeding AIDS, or suicide to end suffering.

The procedures on dead bodies are stipulated by law. The legal distinction is between natural -old age, disease- and unnatural causes. External causes form an in-between "grey area". The doctor makes out the declaration of death. The declarations are processed by the Statistics Office according to ICD 9. Almost all doctors classify by these forms. In the case of an unnatural death, the coroner is notified. The doctor of the Municipal Health Services examines the body, the coroner makes out the

report concerning the circumstances and causes of death. He certifies that there is no suspicion of a crime, and gives the permission for the burial to the family. This procedure takes two to three days. Drug related deaths are considered unnatural, but not a crime; therefore, few autopsies are ordered - in about one third of the cases.

Questions for research included what is distinguishing about the one person who dies of heroin, in contrast to the 5000 who don't. The aim was to find all cases for the course of five years, up to 1990. Of the 175 cases, an obduction was performed in one third of the cases, with a toxicological report. In 67 cases, witness reports could be obtained. Of the 57 obducted cases which were examined three years later, one death turned out to have been caused by haematoma, and also other cases which were checked later, it was concluded that no overdose had taken place, but that the classification as an overdose death had been made on the basis of knowing that the deceased had been a drug addict. Combinations of drugs as given in the toxicological reports included morphine, alcohol, and methadone; in three cases, cocaine and other combinations. Generally, very heterogenous use was found.

Drug use is not seen as a crime, and neither is overdose - there is therefore no search for evidence in a drug death case. In the retrospectively examined sample, 8% had been diagnosed falsely as positive drug overdose deaths.

Recommendations are made towards standardizing the national procedures, validating through intensive local research teams, and creating mortality registers. It is suggested to monitor a project in European areas of high drug use related mortality.

### 10. Spain.

Dr Josep Roca (Spain): There are only statistical sources for 16 large cities, and only for overdose deaths; this is to say, not for indirectly caused drug related deaths. Presently, these data cannot be improved.

Data are collected by the Institutes of Forensic Medicine in the 16 cities. All cases of unnatural death go to these institutes. It is possible to make trend estimates, but the actual number of cases of drug related deaths is not available. By trend indicators, there is no big change over the years; but there are no statistics about the general mortality of drug users. While there are only data for overdoses, these seem to constitute actually about 70% of overdose cases, as an estimate of the Barcelona data. Physicians tend not to describe deaths to drug use.

ICD 9, which is used for natural deaths, is not a good source for drug related deaths. A big problem is constituted by the fact that data only exist for 16 cities, and that furthermore, death

certificates do not give reliable information on the cause of death. The doctor might only put in "heart attack", with no reference to drugs. The definite diagnosis after an autopsy goes only to the Institute of Forensic Medicine at the Justice Ministry, and not to the Statistical Office. The Ministry of Justice does not compile statistics. It is not possible to create such a regulation, this would involve changing the legislation and the medical ethics. Also, this is not considered a priority, more urgent problems are seen elsewhere, mainly in the political concern that people don't take drugs.

Data collection in the 16 cities proceeds through the Institutes of Forensic Medicine reporting deaths to the National Center. Some institutes don't report; in Barcelona, for example, the data have to be collected at the Institute.

The most important drug involved is heroin. Since the acute symptoms of overdoses are assessed, there is no recognition of the AIDS epidemic in the drug death cases.

**11. Sevilla group representative.**

Following the presentations of the national experts, Dr Maravelias explained the project of the Sevilla Working Group on Legal Medicine. The main goal of the Sevilla group is to establish a uniform organization in the EC for legal medicine, as well as for the practice of it; this includes also forensic medicine. For an EC study on drug overdose pathology, a questionnaire designed by Pr. Cohen (Amsterdam) was sent out to the 12 member states, to gain an empirical understanding of the definitions, for example, of the drugs involved, and of the procedures used, for example, to determine the circumstances of death, as well as in the toxicological analysis.

At the Luxemburg meeting of the group on 7/8 October, 1991, a definition of drug related death was agreed upon: "persons having died by the direct pharmacological effect of drugs of abuse, confirmed by toxicological analysis and/or autopsy". Drugs of abuse denote mainly the products mentioned in the Single conventions of 1961 and 1971, that is, cocaine, amphetamines, opiates, hypnotics, hallucinogenics, solvents, tranquillizers, polydruguse, and alcohol in combination.

The questionnaire study involves only 12 centers of forensic medicine which take part in the Sevilla working group. There are five pages reserved in the questionnaire for each -anonymized- case, to describe, for example, where and under what circumstances the body was found, and what the state of nutrition was; furthermore, what biological material was screened for how many days, and what drug levels were found. Cases in the age range 17 to 39 years are assessed.

The secretary of the group will report the information of the 12 member states by the end of November 1991.

Asked about the indirect causes of drug death, for example, in a motorcycle accident in which sedatives and alcohol were involved, Dr Maravelias foresaw possible problems in the inclusion and exclusion of cases, given the criteria of "direct effect". The cases of the past three years which were to be assessed in the questionnairs study would, however, already have been defined. Still, it was objected further, this definition could lead to covering all cases of poisoning, and not of drug abuse. The question remained how frames could be found to define indirect cases. Further questions concerned the definition of drug related death by autopsy; how the autopsy will attribute the cause of death to what is found. Such a causal attribution would presuppose at what level drugs cause overdose. Dr Maravelias replied that this question had been raised in the group, but left open.

A different point was raised concerning the design of the study: for the collation of cases of the past three years, a retrospective definition would not be necessary. Rather, a definition would be needed for prospective studies. The selection criteria of the cases of the past three years were not clear.

**12. Blanche Franck.**

For a perspective from outside of Europe, Dr Blanche Frank gave a presentation about the developments and the research in the area of drug related deaths in New York City. Explaining a table on deaths due to drug abuse, Dr Frank briefly went into the history of heroin use in NYC. Crucial for the death rate of heroin abusers was the route of administration. Intravenous use started between the First and the Second World War, and brought with it the complications of all kinds of infections. Overdose death was less of a problem than the tranmission of diseases. Against infection with Malaria, heroine was diluted with quinine; this, in fact, stopped the further spread. The rise and fall of the death rate over the years depended on the market availability of heroin. The ratio of 78% male to 22% female persists among the deceased. Also consistent is the highest rate in Central Harlem, which is 50 drug related deaths per population of 100.000.
Minorities make up the majority of drug deaths. What has changed is the age, which used to be under the age of 25 years (70%), and now is only 7%. What has further changed is that now the deaths are spread all over the city, whereas they used to be concentrated in the inner city area. Now the ratio is about one third in the iiner city, and two thirds in the other boroughs. There is some good news: in the last three years (1988 to 1990) there has been a decline of drug related deaths, since there has been a decline in cocaine use. And, furthermore, there is a trend away from the needle; the fear of AIDS brought this about, as well as the high quality of heroin (30%), which provides for a good high through sniffing. Dr Frank discussed a study of Dr Michael Boden, who looked at drug deaths in the 1970'ies, when drug involved deaths represented 1% of the deaths in the drug

using population. In a study at her department, the same and other indicators were used to look at drug mortality, such as the purity of heroin, the hospital admissions, and the trend was related to the narcotics register of the years 1963-1984, in which about 300.000 addicts were registered. A comparison of of trend and indicators for 1970-1974 yielded a regeression equation. The indicators provided the possibility to generate some prevalence indicators. It would be good to resurrect a registry, which is a very valuble tool. From the deaths assigned, other causes of death of the addicts registered could be determined, namely, those of precursor symptoms of AIDS (e.g., endiocarditis). AIDS-deaths among i.v. drug users have been underrated.

The new Chief Medical Examiner sees his task in determining the underlying cause -not accidental, and not immediate- that leads to drug related mortality. While before ICD code 304 was used, now all substances which were found are included in the investigation, even when not identified in the death certificate. And everything has to be decided within 2 months, rather than years as before. What is also important, is that NYC now takes part in DAWN, the Drug Abuse Warning Network of the major metropolitan areas. NYC represents 1/4 to 1/3 of the drug involved deaths in the country. The definition of the drug involved deaths compries legal as wwell as illegal drugs, present in toxic quality. Death can either be induced by drugs or drug related. Dependence, psychic effects, suicide, as well as homicide could be reasons. What makes it a desirable system, is that it is anonymous: age, sex, area of residence, and ethnicity are stated. Up to six drugs can be named. The average number of drugs involved is three. This works out better than the ICD code.

To questions about a comparison of the DAWN data and the ICD data, Dr Frank answered that the DAWN data are much more reliable. Earlier, NYC had reported 7 cocaine deaths, when in fact there had been 150. The DAWN system was started in 1972, only NYC participated later.

To determine indicator variables, statistics on the treatment population are important. The narcotics register was stopped because there had been problems with confidentiality; the police tried to have access to the data.

Other questions concern the inclusion of hospital deaths, and of suicides involving drugs in the reported data.

An earlier suggestion of Dr Frank should be mentioned at this point, namely, that the discussions about the criteria of drug involved death would be valuable for the pending 10th revision of the ICD codes, which were due for 1992/93.

## 13. General discussion.

Dr Rodolphe Ingold opened the discussion with a set of questions: what could be said in terms of conclusion, and what in terms of recommendations ? What research would be needed in the near future ? Would it be good to proceed to an epidemiological definition of drug related deaths, in terms of drug deaths being an indirect indicator of drug use ? And what could be said in terms of a preventive perspective ?

Dr Giel van Brussel began with stating that the first step of the research process, the gathering of data, was the most problematic and should be given special attention.

Dr Anni Steentoft saw as a priority in terms of prevention to find out what the drugs involved in deaths are, in relation to other substances and circumstances. A broad toxicological screening could be useful for this purpose.

Dr Alexandra de Rose saw as problematic that most data are gathered by the police, and are not satisfactory in qualitative and quantitative terms. The information from the National Statistics Office would be much better. We should learn how to extract information from the vital statistics. Also, more research should be done to see how much information can be gathered from that source. She would have two methodological warnings: to ensure that the right population of addicts in taken into acount, and that wwe have only some information on indicators of death, but not on mortality.

Dr Patricia Dowdeswell remarked that unless you have a process that every death is screened, indirectly caused deaths would not be included.

Dr Richard Hartnoll recommended for the further working of this group to study a random sample of people of the age 15-40 years, to look in detail at the very young people who die. Whatever information is gathered by as many sources as possible should be looked at, to see if there is evidence for drugs as cause of deaths, outside of drug related deaths. This would mean to look with an open mind at all cases in which drugs might have a part. Death in this age group is often unnatural.

In taking up this suggestion, Dr van Brussel asked why only unnatural death causes should be considered to begin with. If the mortality of the total population of this age group were looked at, there would be easy access to this information in the registers.

Dr Josep Roca proposed that each country should do an indicator. Dr Hartnoll commented that to be consistent within each country, with what the health costs of drug use are, and the preventive implications- the indirect deaths would have to be looked at, too.

Dr van Brussel asked why the interest should be focused on mortality. In Amsterdam studies, mortality would be used as an indicator for the health situation as such. Data could be compared with those of comparable cities (Hamburg). Cases would have to be reviewed, in a combination of epidemiological field work and other research. This would turn out to be less expensive than much other research.

Dr Ingold asked what would be "mortality" in this definition, if we could consider drug related deaths as an indirect indicator. Mentioning an ongoing study, Dr de Rose replied that together with an epidemiologist they were following 2000 drug addicts in a prospective longitudinal study, to see how many die and what are the causes of death.

Dr van Brussel, in favor of a random sample, argued that in a city with a well known drug population, 200-300 cases would have to be studied. Insurance companies, general practitioners, and the families could be asked for information.

Dr Hartnoll stated that in fact it would involve a very different methodology to do a cohort study, if you had the possibility of looking up the people and agencies involved; this would be different from finding indicators of trends and of prevalence. Dr Maravelias said that also his group had been asked by the EC to assess the situation in the different countries, to work on a methodology, and give recommendations. How should we proceed ?

Dr Ingold expressed his view that the important part of the work right now is the discussion, given the many differences between the countries. In some countries, the data that we have comes directly from the police. If we looked at the process of communication, it very often stops at the medico-legal institutes. It seems that there must be social reasons for this.

Dr Boukis expressed his view that EC coordinated research could be useful for data gathering in the different countries.

Dr van Brussel mentioned that if it we wanted to know the causes of deviancy among young people, it would be good to do research among just that group.

Dr Boukis suggested that the form employed for drug related deaths in belgium could be adapted to different countries and institutions.

Dr Maravelias stated that the registry offices are not acting on filling out the forms. A lot of the data collection work would be done by the police.

Dr Boukis saw the advantage of a coordinating office also on the level of establishing statistics.

Several experts expressed their point of view that instruments should be standardized, and that there should be uniform recommendations for research in the EC member countries.

Dr Ingold emphasized the importance that the discussion among the member countries had been started, and that it was impressive how open this discussion had been, and how much had been learned in the course of this meeting about the situation in each of the countries. Towards the reaching of a definition what drug related death would mean for each country, and how it could be defined in an EC context, the European observatory on drugs which is about to be set up will certainly be helpful.

Dr Hartnoll said that a standard definition would not be too helpful, and that an assessment of the differences and what can be made out of them is more useful.

Dr Maravelias said that if a system comparable to the DAWN could be developed in another two or three years, that would be a positive step.

## IV. Recommandations of the Scientific Advisory Committee.

The meeting of the Scientific Advisory Commitee was focused on the research issues that had emerged in the previous presentations and discussion. For future research it was considered important that, first of all, there shoulod be precise descriptions of the different situations of research presently existing in each country. On this basis, recommandations can follow for research on a European level. Certain conclusions can be drawn from the presentations of the situation in the different countries.

1. Data are collected for different purposes on different causes of death. The purposes are defined by Public Health, or by political reasons, or by prevention. The reasons should be distinguished clearly, since they lead to different kind of research and sorts of data.

2. As things stand, it would be a mistake to compare the death rates of different countries; these are measured quite differently.

3. It is necessary to look in the area of future work, which should be an improvement of vital statistics. Work has to be done on how these statistics can be comparable since it is not realistic to assume that the countries will change their lists.

4. For future work, it has to be determined in which areas projects and collaborative work could take place. Such areas could be cohort studies, youth mortality studies or work on indirect indicators of trends.

5. In administrative political terms, somebody has to be responsible for collecting the information from the participating countries.

6. As classification schemes, the impending revision of the ICD should be taken into consideration, as well as other systems -such as DAWN- which might be needed.

7. Toward an improved communication between pathologists and epidemiologists, further meetings such as with the Sevilla Group should take place.

8. It has to be studied how collaborative work can move toward comparability. One path would be operational research designs which proceed from reviewing the detailed data to a cluster analysis. Another possibility would be for conceptual decisions to come first, about direct and different sorts of indirect drug related deaths, and then to include or exclude concrete cases. A small number of cases could be classified as a validation exercise.

9. A study of drug related deaths in a number of cities may face difficulties. On the other hand, such a study would place the statistics in their actual social context. This would provide important information for preventions, for treatment staff, and also forecast consequences of, for example, changing drug use patterns.

10. Street level drugs should be monitored to determine, for example, the purity of heroin, or of what is found in syringes, as part of the forecast.

11. A follow-up meeting in a year is suggested, to review the developments in the 12 member states.

# Preliminary Report on the Problems and Ascertainment of Drug-related Deaths in Ireland

## Definition

As an epidemiologist my opening comment must address what definition is to be used regarding drug-related deaths? We, and in particular the Irish Department of Health, would favour a broad definition for any future monitoring of drug deaths, for example, "deaths arising from direct or indirect misuse of illicit or licit drugs in the general population". The proposed emphasis in Dr. Ingold's protocol of a 15-39 age group would serve as a useful indicator of drug activity among problem drug misusers, but in introducing such an indicator nationally we should ensure maximum benefit of its development.

## Current Data Sources

To date information relating to drug-related deaths is available from the following sources:

- the Central Statistics Office, (C.S.O.);
- Gardai, or police records;
- Coroners' records;
- some data from small studies of drug misuse in defined catchment areas, and
- drug-related AIDS deaths.

However none of these data sources in their present format is adequate for our current task.

## Suicide

Before outlining the process involved in establishing the cause of death under suspicious circumstances a brief explanation is required of the unusual position of suicide in Ireland. While to take one's life remains a criminal offence, it does not exist in law as coroners are prohibited from returning a verdict of suicide and have to couch their findings in ambiguous terms like, self-inflicted hanging, which allows for the possibility that the victim became accidently entangled in

the rope; drug overdose, without stating whether or not it was self-administered. This bizarre legal position arose in 1985 when a coroner's verdict of suicide was appealed to the High Court and the trial judge ruled that under the 1962 Coroner's Act that a coroner was not entitled to return a suicide verdict as this both censured the deceased and could have a bearing on the question of civil liability that might subsequently arise.

I will now outline the process by which appropriate information is collected from a range of institutions where cases of unnatural deaths occur which will hopefully clarify the situation.

Process

When a death occurs and a death certificate is not forthcoming from a medical practitioner the gardai, or police, notify the coroner who orders a post-mortem examination. Should the post-mortem reveal death to be due to natural causes the coroner will issue a death certificate in accordance with the medical evidence, and that will be the end of the matter.

If, on the other hand, the post-mortem reveals death to be due to other than natural causes the coroner is obliged to hold an inquest. At his discretion, the coroner who may be a medical doctor, or a lawyer, may empanel a jury for a hearing.

The gardai investigating the circumstances of the death will have gathered pertinent evidence from relatives, doctors, eyewitnesses and other relevant persons. These data are recorded on two separate forms, form C71, which is a report to the coroner and Form 104, introduced by the CSO in 1967 which requests the gardai involved in the case to answer, among other questions, one relating to whether death was accidental, suicidal, homicidal, or undetermined.

In summary the crucial documents involved in the compilation of official statistics are

- the Coroner's Certificate which records the cause of death and other personal detail. This goes to the Registrar of Births and Deaths from which the Medical Certificate of the Cause of Death is completed;

- Form 102, containing details of the Coroner's Certificate which is sent from the Registrar of Births and Deaths to the CSO;

- Form 104, the confidential statistical form sent by the Gardai to the CSO;

- the Medical Certificate of the Cause of Death which in time also reaches the C.S.O.

These documents provide the basis for the publication by the C.S.O. of mortality statistics, including suicide, in their reports on Vital Statistics.

It should be noted that a lobby is actively engaged in redressing the current legal position of suicide in Ireland.

Other documents relevant to drug related deaths retained by the coroner include Form C71 completed by the Gardai, and the Abstract of the Coroner's Verdict which forms part of the file in cases of unnatural deaths.

Available Data

To recap, information on drug related deaths is currently available from

- the C.S.O. and mortality statistics can be provided by specified ICD 9 codes for 1976-1990 (inclusive) (Data prior to 1976 is not considered compatible, referring as it does to ICD8) for all requested protocol variables by e.g., age, sex, region, cause of death. Likewise suicide and traffic accident deaths for the same period are available, and of course basic national demographic data from the 1986 census. There will be a charge for providing this requested information.

The Central Intelligence Office of the Gardai are also willing to provide information on drug related deaths for a specified number of years. They note, however, that they have no statistical function in this respect and their data may not be comprehensive.

The Coroner's office in Dublin has responded favourably to our request to access to their files on inquests and post-mortems. On average there are 2,000 PMS and 3-400 inquests per annum in the Dublin area. We would have to employ a suitable person to access this material in a predetermined way.

A follow-up study is near completion of a group of opiate users in a defined inner city area in Dublin where 10% of the population aged 15-24 10 years ago were then misusing heroin mostly injecting, on a daily basis. The researchers state that preliminary findings suggest that 60% of the former drug misusing population have been tested for HIV, with 85% showing up as positive. The number of deaths among that group they view to-date as small, no more than eight out of the original cohort, but they expect this figure to rise. These figures are tentative but when the study is complete it should provide an interesting insight into the death rate for that small, but homogenous group of drug users from a defined area.

There will be no problem in obtaining drug-related AIDS deaths. To date 91 persons have died from AIDS, of whom 42% were drug-related.

<u>The Proposed Plan</u>

Our plan is to collect information from the CSO, as directed by the protocol for the years 1976-1990. Because we are aware that we will miss some drug-related deaths by adopting this procedure, due to the fact that the underlying cause of death is that coded, we propose to also examine the coroners records. It might be feasible to look at such records over a period of one year and make a crude comparison between drug related deaths thus ascertained with those for the same period from the CSO.

We will also attempt to examine critically definitions and procedures used to collect drug related deaths by the Gardai, and for AIDS deaths. We also plan to liaise with Dr. J. Harbison who is involved in a similar type study, to pool resources and reduce duplication. Several discussions have already taken place with him.

At the conclusion of this exercise we hope to make a proposal which would establish accurate ongoing ascertainment of drug related deaths.

**Aileen O'Hare.**

**24th October, 1991.**

I

# DENMARK

## Government circular of 1970.10.22.

Deaths related to abuse of narcotic drugs have to be subjected to medicolegal autopsy and toxicological investigation.

# DENMARK

## DRUG RELATED DEATHS

THE POLICE REQUESTS — Medicolegal autopsy and Toxicological investigations at the Institutes of Forensic Medicine

FROM THE INSTITUTES:

a) Reports including the cause of death are send to the police.
The registration of drug related deaths for the whole country is made by the police and published in an annual.

b) Death certificates are send to the National Health Service.
Registration according to WHO's international classification.

c) Research

I II

# DENMARK

## The definition used of the police for the registration of drug related deaths

All deaths related to:

A) ABUSE OF SUBSTANCES LISTED IN SINGLE CONVENTION ON NARCOTIC DRUGS 1961, SCHEDULE 1 AND 2 AND THE INTERNATIONAL CONVENTION ON PSYCHOTROPIC SUBSTANCES 1971, SCHEDULE 1 AND 2.

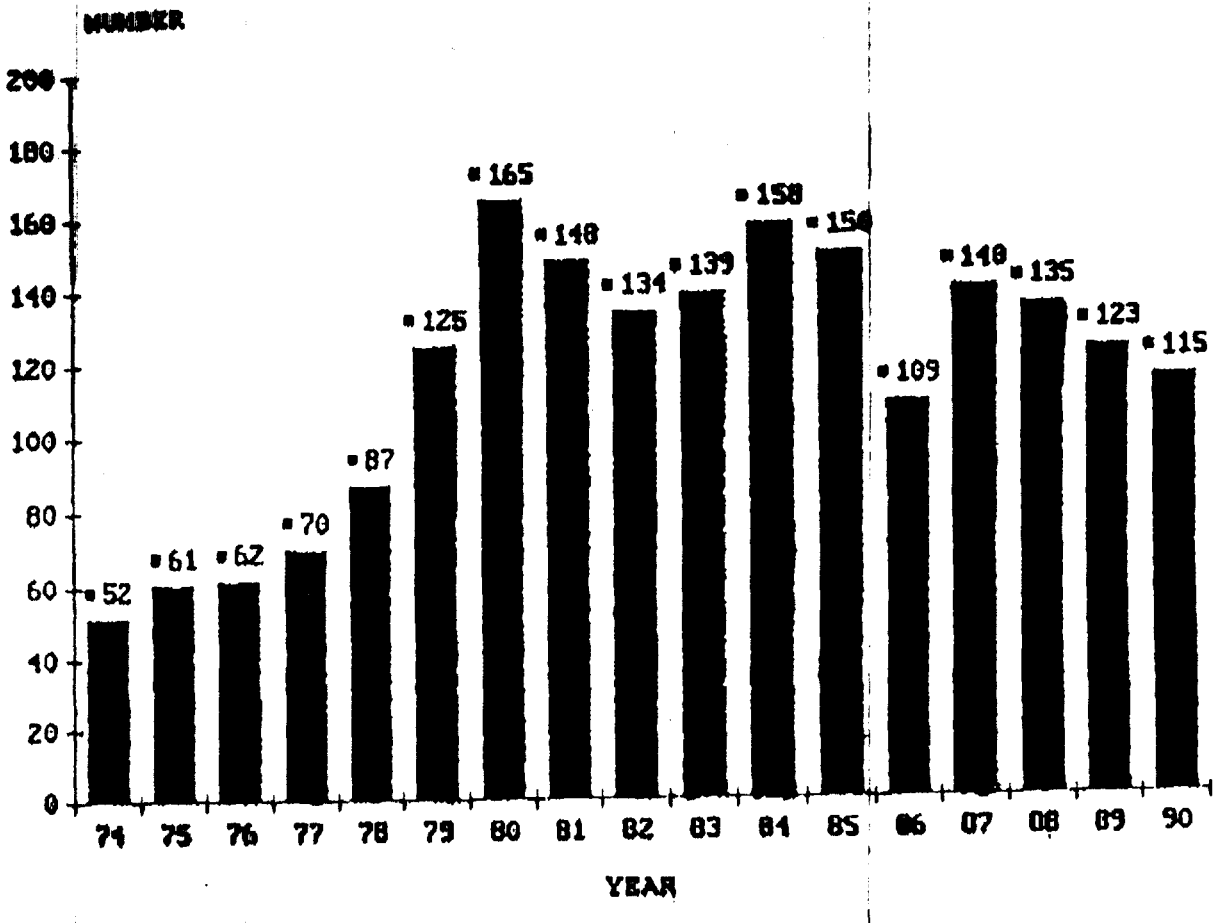
B) USE/ABUSE OF OTHER DRUGS AND WHERE THE DECEASED IS KNOWN AS AN ABUSER OF THE UNDER A) MENTIONED SUBSTANCES.

C) USE/ABUSE OF SUBSTANCES NOT INCLUDED UNDER A), BUT WHERE THE PURPOSE OF THE INTAKE IS TO ACHIEVE AN EUPHORIA.

# DENMARK

## DRUG RELATED DEATHS

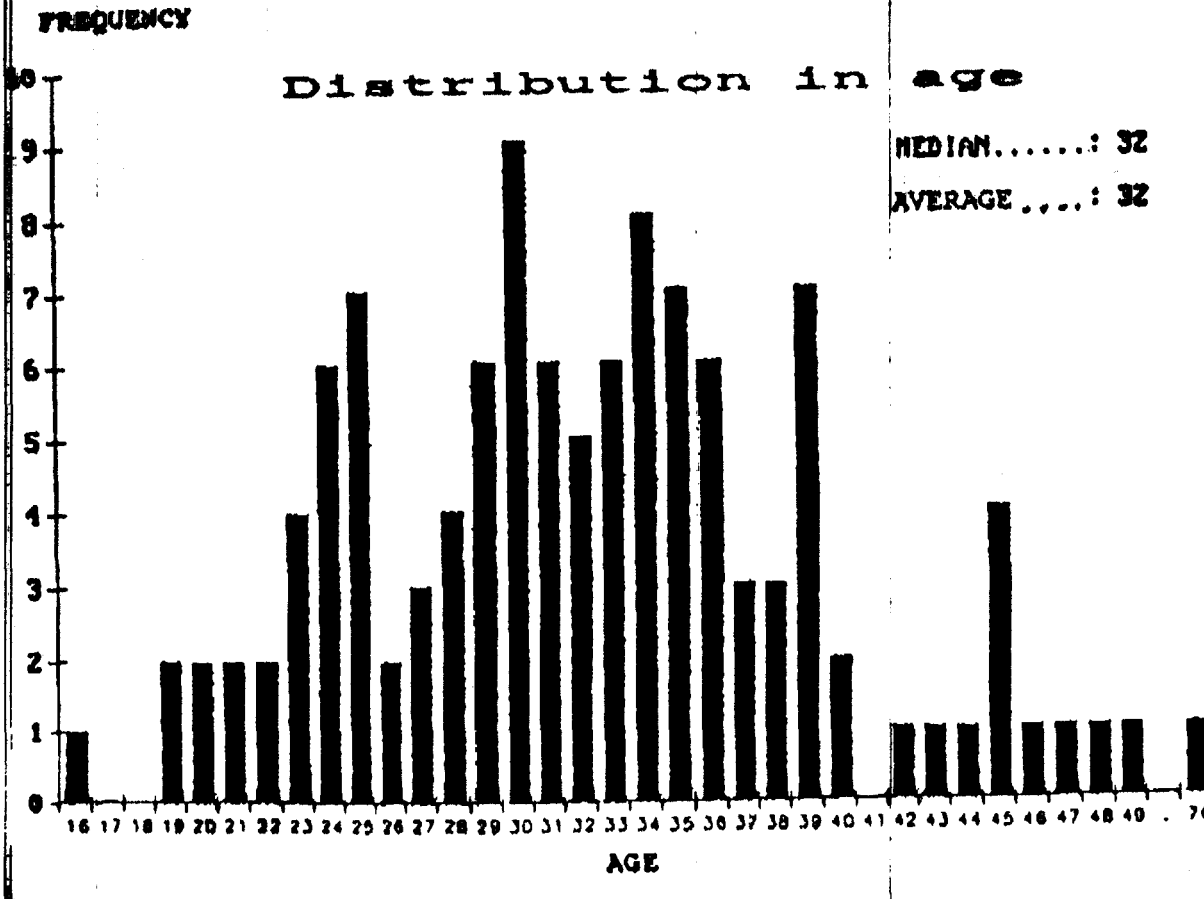
ACCORDING TO THE REGISTRATION OF THE POLICE



# DENMARK

## DRUG RELATED DEATHS IN 1990

ACCORDING TO THE REGISTRATION OF THE POLICE



VI

# DENMARK

## FATAL INTOXICATIONS IN THE NORDIC COUNTRIES

A FORENSIC TOXICOLOGICAL STUDY WITH SPECIAL REFERENCE TO YOUNG DRUG ADDICTS* (SUPPORTED BY THE NORDIC COUNCIL FOR ALCOHOL AND DRUG RESEARCH (NAD)).

### DEFINITION OF DRUG ADDICTS

IN THIS STUDY DRUG ADDICTS ARE PERSONS WHO ACCORDING TO INFORMATION FROM POLICE REPORTS AND/OR AUTOPSY REPORTS, WERE KNOWN TO HAVE BEEN INTRAVENOUS ADDICTS AND/OR ABUSERS OF DRUGS LISTED IN THE SINGLE CONVENTION ON NARCOTIC DRUGS 1961, SCHEDULE 1 AND/OR CONVENTION ON PSYCHOTROPIC SUBSTANCES 1971, SCHEDULE 1 AND 2.

* Reference: A. Steentoft et al
Z.Rechtmed. (1989), 102: 355-365.

VIII

# DENMARK

FATAL INTOXICATIONS PER $10^5$ POPULATION (AGE GROUP 15-34 YEARS) INVESTIGATED IN FORENSIC TOXICOLOGICAL LABORATORIES IN THE NORDIC COUNTRIES, 1984 AND 1985.**

DRUG ADDICTS

| Intoxicant | Denmark | Sweden* | Norway | Finland | Iceland |
|---|---|---|---|---|---|
| Drugs | 6.2 | 1.3 | 2.0 | 0.36 | 0 |
| Ethanol | 0.10 | 0.04 | 0.08 | 0.13 | 0 |
| Carbon monoxide | 0 | 0 | 0 | 0.13 | 0 |
| Miscellaneous | 0 | 0 | 0.04 | 0 | 0 |
| Total | 6.3 | 1.4 | 2.2 | 0.6 | 0 |

*The Swedish material includes only 1984.

**Reference: A. Steentoft et al
Z.Rechtmed. (1989), 102: 355-365.

PK

# DEFINITION OF DRUG ADDICTS

IN THIS STUDY DRUG ADDICTS ARE PERSONS WHO ACCORDING TO INFORMATION FROM POLICE REPORTS AND/OR AUTOPSY REPORTS, WERE KNOWN TO HAVE BEEN INTRAVENOUS ADDICTS AND/OR ABUSERS OF DRUGS LISTED IN THE SINGLE CONVENTION ON NARCOTIC DRUGS 1961, SCHEDULE 1 AND/OR CONVENTION ON PSYCOTROPIC DRUGS 1971, SCHEDULE 1 AND 2.

DK .

# The definition used of the police for drug related deaths:

A) ABUSE OF SUBSTANCES LISTED IN SINGLE CONVENTION ON NARCOTIC DRUGS 1961, SCHEDULE 1 AND 2 AND THE INTERNATIONAL CONVENTION ON PSYCOTROPIC SUBSTANCES 1971, SCHEDULE 1 AND 2.

B) USE/ABUSE OF OTHER DRUGS, WHERE THE DECEASED IS KNOWN AS AN ABUSER OF THE SUBSTANCES MENTIONED UNDER A)

C) USE/ABUSE OF SUBSTANCES NOT INCLUDED IN A), BUT WHERE THE PURPOSE OF THE INTAKE IS TO ACHIEVE EUPHORIA.

# THE IMPACT OF ILLICIT DRUG USE ON CAUSE SPECIFIC MORTALITY OF YOUNG ADULTS IN ROME, ITALY.

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Running head:

Mortality among intravenous drug users.

ABSTRACT

An historical cohort study has been carried out to examine overall and cause specific mortality among intravenous drug users. A total of 4200 intravenous drug users (3411 men and 789 women), enrolled in methadone treatment centers between 1980 and 1988, were studied. There were 239 deaths during the follow up period. The overall SMR was 10.10 in the entire cohort (95% confidence interval 8.86 to 11.47), 9.30 in males, and 18.07 in females. A large excess of mortality in both sexes was found for infectious, circulatory, respiratory, and digestive diseases as well as from violence, overdose, AIDS, and unknown or ill-defined causes. Tumors and suicide were excessive only in males. Deaths due to drug overdose, violence or trauma and cirrhosis accounted for 63.6%, AIDS for 7.1%, endocarditis and other bacterial infections for 7.1%, and neoplasms for 3.8% of total mortality. Deaths attributed to various causes increased sharply in 1987-88, after the emergence of AIDS mortality. The proportion of all deaths attributable to intravenous drug use in the 15-34 age group in Rome population was 16.0% and 6.1% in males and females, respectively. The cause-specific attributable proportions were 65.8% for endocarditis and 37.1% for cirrhosis in males, and 27.1% for both endocarditis and cirrhosis in

females. These findings document increasingly serious health consequences of drug abuse in Italy.

KEY WORDS

Intravenous drug use, cohort study, mortality, attributable proportion, heroin abuse.

INTRODUCTION

International concern about the possible strategies for combatting illicit drug use[1,2,3,4], and the challenge of the spread of human immunodeficiency virus (HIV) infection among intravenous drug users[5] (IVDUs) and from IVDUs to the "general heterosexual population"[6,7,8], call for epidemiologic data on the health implications of substance abuse[9]. Since the emergence of the acquired immunodeficiency syndrome (AIDS) epidemic, however, most studies have focused on IVDUs infected with the HIV, investigating the prevalence and incidence of, and risk behaviors for HIV infection with less attention devoted to overall morbidity and mortality data in the population of drug users. There are indication, however, that IVDUs are at increased risk of death from overdose, trauma and infectious diseases[10,11,12,13,14,15]. More recently an increasing trend of overall mortality among IVDUs of New York City has been reported[16].

Italy, along with few other geographical areas[17,18], has a peculiar pattern of occurrence of AIDS and HIV infections, characterized by a high proportion of IVDUs among AIDS cases. In a metropolitan area such as Rome (about 3 million population) a total of 783 AIDS cases have been reported (as of June 30, 1990) and, among the age group 15-34, 73%

have been reported as IVDUs; moreover, the prevalence of HIV infection among IVDUs on methadone treatment has been estimated between 40 and 45%[19]. Our study describes the pattern of mortality in a large cohort of IVDUs in Rome during the period of transition into the "AIDS Era".

## METHODS

Since the beginning of the eighties, as a consequence of a national law, twenty Public Treatment Centers (PTCs) for drug abuse are operating in Rome. The access to PTCs, scattered around the city, is open to drug users (mainly heroin intravenous drug users) residing in each catchment area and agreeing to a specific treatment plan. Treatment strategies vary considerably within and among PTCs[20], with low-dose methadone maintenance the most widely used approach.

The three largest PTCs of Rome were selected for the study. Information available from their clinical records included patient name, sex, place and date of birth, residence, occupation, education, date of first and last visits, age at first drug use, primary drug used, and frequency of use on entry to the treatment program. All the drug users who presented at least once to one of these three centers during the period 1980-1988 were enrolled in

the cohort.

Vital status was ascertained through the registry office of the last municipality of residence as of 31 December 1988. Cause of death was ascertained through record linkage with the national mortality file[21] for deaths occurring between 1980 and 1987. For deaths occurring in 1988 or not found at the linkage procedure, death certificates were retrieved from the municipality of death and coded by an experienced nosologist according to the 9$^{th}$ revision of the International Classification of Diseases.

Person-years at risk of dying were computed using a modified life table analysis program[22]. Each subject was considered from the date of first enrollment through the end of 1988 or to the date of death. Subjects lost to follow-up were considered alive as to 31 December 1988. Standardized Mortality Ratios (SMRs) were used to compare the mortality experience of drug users with that of the total national population. The expected numbers of deaths in the cohort were calculated by applying the national mortality rates, stratified by sex and age (in five years classes), for the period 1980-1985 to the corresponding person-year distribution of the entire cohort. Ninety-five percent Confidence Intervals (95% CI) based on the

assumption of a Poisson distribution of the observed deaths (two-tailed test) were calculated with exact limits. Finally, in order to examine temporal trends, annual mortality rates were directly adjusted to the age specific person-years distribution of the entire cohort.

## RESULTS

A total of 4,473 subjects were initially enrolled; 273 were excluded because the identifying data on their records was insufficient to verify vital status, yielding a final sample of 4200 IVDUs (Table 1). The cohort was 81.2% male; intravenous heroin was the primary drug of 96.6%; 75% enrolled between age 20 and age 29. Over 50% of the IVDUs in the cohort started injecting heroin before their 20$^{th}$ birthday, and approximately 25% continued their studies after completing the compulsory Junior High School (at approximately age 14). The 273 subjects not included in the study were similar to the study sample for all the characteristics described in table 1 except that the year of entry into PTCs was slightly shifted towards the early period of activity of the centers.

At the end of follow-up 3782 (90%) subjects were known to be alive, 239 (5.7%) were deceased, and for 179 (4.3%) vital status could not be ascertained. There were 23,996 person-years of observation.

The temporal trends of overall and cause-specific mortality among IVDUs in the cohort are summarized in Table 2. Mortality rates decrease from 1980 (15.3/1,000 prs-yrs) to 1985 (9.0/1,000 prs-yrs); there was a sudden drop in 1986 (5.38/1,000 prs-yrs) attributable to a greatly reduced number of deaths due to overdose. In 1987 and 1988 mortality increased to 11.8 and 17.4 per 1000 prs-yrs, respectively. This is only partially explained by greater AIDS mortality with deaths from overdose and violence increasing as well. Other causes of death also increased slightly, mainly because of mortality due to "ill-defined conditions".

The expected number of deaths during the study period was of only 23.66 deaths in comparison with the 239 observed yielding to an overall SMR of 10.10 (95% CI = 8.86-11.47). Tables 3 and 4 show sex- and cause-specific mortality in the cohort. Excess mortality was found in both sexes for all categories of causes. The excess mortality is mainly

due to overdose (32% of total deaths in males and 41% in females), at 3.38/1,000 prs-yrs for both sexes, but violence (1.62/1,000 prs-yrs), cirrhosis (0.88 deaths/1,000 prs-yrs), and AIDS (0.71/1,000 prs-yrs) also contribute.

The SMR for all causes of death is higher among females (SMR = 18.07; 95% CI = 12.85-24.71) than among males (SMR = 9.30; 95% CI = 8.06-10.68) but excess mortality from suicide is seen only among males; on the other hand SMRs for pneumonia and septicaemia are higher in females. Finally, the SMR for malignancies in males is significantly higher than in the general population (2.68; 95% CI = 1.16-5.29).

When a selected group of causes of death are analyzed by age of death (Table 5), the overall excess risk of dying is seen to decrease as age increases. A contrary trend is noted only for cirrhosis, suicide, and AIDS.

The finding of such large excess in mortality in this study group prompted us to speculate on the possible impact of drug use on the mortality of the general population of young adults in Rome during the period of the study. In other words, we deemed of interest to calculate the proportion of cause-specific deaths due, at least in theory, to intravenous drug use among Roman young adults

aged 15-34. Two pieces of information were then needed: the relative risk of dying for a specific cause, and the proportion of parenteral drug users in the general population[23]. Relative risks were estimated from the cause specific observed/expected ratios. The average number of IVDUs in the general population aged 15-34 years was estimated as that of the individuals at risk of death by overdose applying the so-called "multiplier formula"[24,25]. It was simply calculated by dividing the average number of overdose deaths registered among residents in Rome (age 15-34; period 1980-86) by the mortality rates for overdose in the cohort during the entire period of follow-up. On that basis, 11,473 persons aged 15-34 resulted to be at risk of dying from overdose in Rome (9,958 males and 1,515 females), corresponding to 22.10/1000 and 3.42/1000 of the total male and female population. Using these figures, the estimated proportion of all deaths among young Romans attributable to injecting drug use is 16.0% in males and 6.1% in females (Table 6). Interestingly, two-thirds of the deaths from endocarditis and more than one-third of the deaths from cirrhosis among young men in Rome seem to be attributable to intravenous drug use.

## DISCUSSION

The study shows a risk of death increased by tenfold in male and twenty-fold in female IVDUs. The excess risk of death is observed for most causes of death, including neoplasms in males. One in 6 of all deaths in males, and over 1 in 20 in females in the 15-34 age group of the general population of Rome could be attributed to intravenous use of illicit drugs.

Our study population is limited to drug injectors presenting to public treatment centers, who may be different both in character and in exposure to toxic substances from street addicts and occasional users. Caution should then be used in the generalizability of the results. Moreover, drug users are a dynamic population, with some current users permanently stopping drug use each year, but we could not take into account these changes since no information was available.

The linkage procedure with the national mortality file to ascertain the coded causes of death was fairly complete (95%) and it assures that the causes of death we studied are comparable in all respects with those of the general population. Mortality from overdose, however, is probably underestimated, some such deaths being incorrectly ascribed to "ill-defined causes of death" or "other heart diseases".

The mortality experience of the cohort has been compared to that of the Italian general population. It would have been more appropriate to use a more restricted population such as that of Rome to assure comparability; on the other hand, the use of national standards would increase the stability of reference numbers, especially in the young population. We examined, however, the cause-specific SMRs for 15-34 year olds in the city of Rome compared to Italy during the period 1980-84 and we found SMR values approximating unity for all categories but overdose, endocarditis, and violence with SMRs of 3.7, 1.67, 0.73 respectively. On that basis, only slightly different results could have occurred using local standards.

We did control for age and sex in calculating SMRs, but no information is available about other potential confounders, namely social class, smoking and alcohol consumption. Since the educational level and the occupational status of our cohort members indicate a lower social class level which is peculiar of a young and generally disadvantaged population such as IVDUs, part of the increased risk of death could be explained on this basis. In a study performed in Northern Italy it seems, however, that the differences in the overall mortality for social class is not grater than twofold[26].

Our data agree with published findings about an excess mortality for cirrhosis, endocarditis, septicemia, trauma, and suicide[10-16], and non-infectious heart disease[27]. The impact of AIDS mortality on the study population is evident since 1987 and, even if by the end of 1988 AIDS was not the first cause of death, the increase in overall mortality accompanying the emergence of AIDS might support the suggestion of Stoneburner et al.[30] that HIV-induced deaths may be hidden among "suicidal overdoses", "other violence", and "infectious causes". The association between HIV infection and mortality from AIDS and other causes of death cannot be investigated, given the unavailability of data on HIV infection before 1985.

The excess mortality we found from neoplasms in males is to our knowledge unprecedented in the literature. Even though chance alone could be responsible of this result, a possible confounding from smoking and alcohol consumption could have taken place, given their strong association with illicit drug use[28-29]. Immunosuppression or even HIV infection might also play a role in cancer development but such hypothesis deserves further investigations.

We could found no excess mortality from tuberculosis[30]. This could be attributed to the limited power of this

study, which for this cause of death would have been able to demonstrate a relative risk of 2.0 with 80% power and alpha = 0.05 only if the number of expected deaths would have been at least 11.8, in contrast to the actual 0.07. It may be said, however, that one large cross-sectional study from Italy showed an only marginally increased risk for tuberculosis among seropositive drug injectors[31].

Our results allowed us to estimate the proportion of deaths attributable to injecting drug use in the young population of Rome, which emerges as a major cause of premature mortality[32]. The reliability of our figures is strongly dependent on the number of drug users we estimated in the community. We used a method, the "multiplier formula", well-known for estimating the size of sparse population such as drug users[24,25]. This method is based on the linear relation between prevalence of drug users and number of overdose deaths and, therefore, assumes that the force of mortality from overdose is the same in our study population and in the general population of drug users[24]. In fact, the time trend of the specific death rate for overdose in our cohort seems to reflect the trend of mortality from overdose in Rome during the same period. Given these caveats and considering that our estimate refers only to IVDUs at risk of dying from overdose, we believe that our

estimate must be considered as the "minimum estimate" of the diffusion of intravenous drug dependance and therefore "minimum estimate" of the proportion of deaths attributable to intravenous drug use in the young population of Rome.

Our results are of some interest for the mathematical modelling of the HIV epidemic in Italy[33] and in other areas where intravenous drug use and heterosexual transmission of HIV are gaining importance. It is plausible, in fact, that the estimate of the incubation periods, and therefore of the duration of infectivity, will have to be modified when competitive mortality, as suggested here, is allowed for.

In conclusion, our findings support the evidence of drug abuse as an important and increasing cause of mortality in the young in Rome as well as in New York City[16]. This should be carefully taken into consideration for urgent preventive and treatment strategies.

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TABLE 1

RELEVANT CHARACTERISTICS OF INTRAVENOUS DRUG USERS IN THE COHORT. ROME, ITALY 1980-88

| | MALES (N=3411) | | FEMALES (N=789) | | TOTAL (N=4200) | |
|---|---|---|---|---|---|---|
| | N | % | N | % | N | % |
| AGE OF ENTRY INTO PTC* | | | | | | |
| <20 | 428 | 12.5 | 150 | 19.1 | 578 | 13.8 |
| 20-24 | 1644 | 48.2 | 355 | 45.2 | 1999 | 47.6 |
| 25-29 | 981 | 28.7 | 191 | 24.3 | 1172 | 27.9 |
| >29 | 361 | 10.6 | 90 | 11.4 | 451 | 10.7 |
| MARITAL STATUS | | | | | | |
| unmarried | 1783 | 64.1 | 329 | 52.7 | 2112 | 62.0 |
| married | 999 | 35.9 | 295 | 47.3 | 1294 | 38.0 |
| EDUCATION (years) | | | | | | |
| <6 | 821 | 28.7 | 79 | 12.4 | 900 | 25.8 |
| 6-8 | 1404 | 49.2 | 283 | 44.6 | 1687 | 48.3 |
| >8 | 631 | 22.1 | 273 | 43.0 | 904 | 25.9 |
| EMPLOYMENT | | | | | | |
| employed | 1392 | 49.4 | 195 | 29.2 | 1587 | 45.5 |
| unemployed | 1428 | 50.6 | 474 | 70.8 | 1902 | 54.5 |
| YEAR OF ENTRY INTO PTS | | | | | | |
| 1980-82 | 2152 | 63.0 | 452 | 57.5 | 2604 | 62.0 |
| 1983-85 | 668 | 19.6 | 174 | 22.1 | 842 | 20.0 |
| 1986-88 | 594 | 17.4 | 160 | 20.4 | 754 | 18.0 |
| AGE AT FIRST DRUG USE | | | | | | |
| <15 | 85 | 2.8 | 35 | 5.1 | 120 | 3.2 |
| 15-19 | 1448 | 47.7 | 329 | 47.6 | 1777 | 47.7 |
| 20-24 | 1130 | 37.2 | 237 | 34.3 | 1367 | 36.7 |
| >24 | 371 | 12.3 | 90 | | 461 | 12.4 |
| PRIMARY DRUG USED | | | | | | |
| heroin | 3264 | 96.8 | 743 | 95.7 | 4007 | 96.6 |
| other | 107 | 3.2 | 33 | 4.3 | 140 | 3.4 |
| FREQUENCY OF USE | | | | | | |
| more than once a day | 2492 | 73.0 | 590 | 81.8 | 3082 | 73.4 |
| more than once a week | 326 | 9.5 | 53 | 0.1 | 379 | 9.0 |
| more than once a month | 9 | 0.3 | 4 | 0.4 | 13 | 0.3 |
| unknown | 586 | 17.2 | 139 | 17.7 | 725 | 17.3 |

*Public Treatment Center

TABLE 2
MORTALITY AMONG DRUG USERS (MALES AND FEMALES) BY YEAR OF DEATH. ROME, ITALY 1980-88.

| | YEAR OF DEATH | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 |
| PERSON-YEARS | 312 | 1491 | 2290 | 2746 | 3052 | 3242 | 3405 | 3605 | 3855 |
| ALL CAUSES | | | | | | | | | |
| N. deaths | 5 | 16 | 23 | 23 | 26 | 29 | 19 | 44 | 54 |
| Rates (x1000)* | 15.3 | 11.8 | 10.9 | 8.4 | 9.0 | 9.0 | 5.4 | 11.8 | 17.4 |
| OVERDOSE | | | | | | | | | |
| N. deaths | 1 | 6 | 9 | 8 | 13 | 11 | 3 | 11 | 19 |
| Rates (x1000) | 1.9 | 5.5 | 4.0 | 2.8 | 4.3 | 3.3 | 0.8 | 2.8 | 5.7 |
| INJURIES,SUICIDES | | | | | | | | | |
| N. deaths | 2 | 4 | 6 | 7 | 6 | 6 | 5 | 7 | 7 |
| Rates (x1000) | 3.0 | 3.2 | 2.0 | 1.9 | 2.0 | 1.8 | 1.6 | 1.8 | 3.0 |
| CIRRHOSIS | | | | | | | | | |
| N. deaths | - | - | 2 | - | 1 | 3 | 4 | 5 | 6 |
| Rates (x1000) | - | - | 1.5 | - | 0.3 | 1.0 | 1.1 | 1.0 | 1.3 |
| AIDS | | | | | | | | | |
| N. deaths | - | - | - | - | - | - | 1 | 7 | 9 |
| Rates (x1000) | - | - | - | - | - | - | 0.4 | 1.6 | 2.7 |
| ALL OTHERS | | | | | | | | | |
| N. deaths | 2 | 6 | 6 | 8 | 6 | 9 | 6 | 14 | 13 |
| Rates (x1000) | 10.4 | 3.1 | 3.3 | 3.7 | 2.4 | 2.9 | 1.6 | 4.6 | 4.7 |

* Age-standardized by the direct method

TABLE 3

CAUSE SPECIFIC MORTALITY AMONG MALE DRUG USERS. 19,662 PERSON-YEARS.
(Obs= observed deaths; Exp= expected deaths; SMR= standardized mortality ratio; 95% CI= 95% confidence intervals)

| CAUSE OF DEATH* | OBS | EXP | SMR** | 95% CI*** |
|---|---|---|---|---|
| All causes (000-999) | 200 | 21.50 | 9.30 | 8.06-10.68 |
| Septicemia (038) | 2 | 0.03 | 67.75 | 8.23-244.76 |
| Tuberculosis (010-018) | 1 | 0.07 | - | - - |
| All malignant neoplasms (140-239) | 8 | 2.97 | 2.68 | 1.16-5.29 |
| nasopharynx (147) | 1 | 0.07 | - | - - |
| digestive organs (150-159) | 4 | 0.58 | 6.88 | 1.88-17.61 |
| stomach (151) | 1 | 0.18 | - | - - |
| colon (153) | 2 | 0.16 | 12.30 | 1.49-44.43 |
| pancreas (157) | 1 | 0.07 | - | - - |
| respiratory organs (160-165) | 1 | 0.42 | - | - - |
| brain (191) | 1 | 0.25 | - | - - |
| lymphatic and hematopoietic tissue (200-208) | 1 | 0.19 | - | - - |
| AIDS (279) | 16 | - | - | - - |
| Overdose (304) | 65 | - | - | - - |
| Diseases of nervous system (320-389) | 2 | 0.60 | 3.32 | 0.40-12.01 |
| Diseases of circulatory system (390-459) | 22 | 2.60 | 8.47 | 5.31-12.82 |
| Hypertensive disease (401-405) | 2 | 0.06 | 31.84 | 3.86-114.97 |
| Ischemic heart disease (410-414) | 1 | 0.95 | - | - - |
| Endocarditis (421;424) | 6 | 0.08 | 77.12 | 28.30-167.84 |
| Other forms of heart dis. (420;422-423;425-429) | 10 | 0.60 | 16.52 | 7.93-30.40 |
| Cerebrovascular disease (430-438) | 1 | 0.60 | - | - - |
| Dis. of arteries or veins (440-459) | 2 | 0.30 | 6.68 | 0.81-24.14 |
| Diseases of respiratory system (460-519) | 3 | 0.48 | 6.18 | 1.28-18.09 |
| Pneumonia (480-486) | 2 | 0.22 | 9.19 | 1.11-33.21 |
| Diseases of digestive system (520-579) | 20 | 1.21 | 16.54 | 10.10-25.56 |
| Cirrhosis (571) | 18 | 0.81 | 22.23 | 13.17-35.14 |
| Injuries and poisoning (800-999) | 46 | 11.58 | 3.97 | 2.91-5.30 |
| Suicides (E950-959) | 11 | 1.61 | 6.81 | 3.40-12.19 |
| Ill-defined conditions (780-799) | 6 | 0.50 | 12.05 | 4.40-26.25 |
| Unknown causes | 9 | - | - | - - |

*Deaths are coded according to the International Classification of Diseases, Ninth Revision, 1975

** SMR were not computed for categories with fewer than two deaths

*** Two-tailed test

TABLE 4

CAUSE SPECIFIC MORTALITY AMONG FEMALE DRUG USERS. 4,334 PERSON-YEARS.
(Obs=observed deaths; Exp= expected deaths; SMR= standardized mortality ratio; 95% CI= 95% confidence intervals)

| CAUSE OF DEATH* | OBS | EXP | SMR** | 95% CI*** |
|---|---|---|---|---|
| All causes (000-999) | 39 | 2.16 | 18.07 | 12.85-24.71 |
| Septicemia (038) | 2 | 0.00 | 509.94 | 61.96-1842.17 |
| Tuberculosis (010-018) | - | 0.01 | - | - - |
| All malignant neoplasms (140-239) | 1 | 0.61 | - | - - |
| nasopharynxs (147) | - | 0.01 | - | - - |
| digestive organs (150-159) | - | 0.11 | - | - - |
| stomach (151) | - | 0.04 | - | - - |
| colon (153) | - | 0.03 | - | - - |
| pancreas (157) | - | 0.01 | - | - - |
| cervix uteri (180) | 1 | 0.00 | - | - - |
| respiratory organs (160-165) | - | 0.03 | - | - - |
| brain (191) | - | 0.03 | - | - - |
| lymphatic and hematopoietic tissue (200-208) | - | 0.14 | - | - - |
| AIDS (279) | 1 | - | - | - - |
| Overdose (304) | 16 | - | - | - - |
| Diseases of circulatory system (390-459) | 5 | 0.37 | 13.52 | 4.38-31.59 |
| Hypertensive disease (401-405) | - | 0.02 | - | - - |
| Ischemic hearth disease (410-414) | - | 0.06 | - | - - |
| Endocarditis (421;424) | 1 | 0.01 | - | - - |
| Other forms of heart dis.(420;422-423;425-429) | 2 | 0.10 | 20.81 | 22.05-655.74 |
| Cerebrovascular disease (430-438) | 2 | 0.12 | 16.12 | 1.95-58.23 |
| Dis. of arteries or veins (440-459) | - | 0.06 | - | - - |
| Diseases of respiratory system (460-519) | 3 | 0.08 | 37.11 | 7.65-108.51 |
| Pneumonia (480-486) | 3 | 0.03 | 87.97 | 18.14-257.2 |
| Diseases of digestive system (520-579) | 3 | 0.12 | 24.38 | 5.03-71.29 |
| Cirrhosis (571) | 3 | 0.07 | 39.68 | 8.18-116.03 |
| Injuries and poisoning (800-999) | 4 | 0.60 | 6.66 | 1.81-17.07 |
| Suicides (E950-959) | - | 0.13 | - | - - |
| Ill-defined conditions (780-799) | 2 | 0.04 | 45.55 | 5.51-164.5 |
| Unknown causes | 2 | - | - | - - |

*Deaths are coded according to the International Classification of Diseases, Ninth Revision, 1975

** SMR were not computed for categories with fewer than two deaths

*** Two-tailed test

TABLE 5.

MORTALITY AMONG DRUG USERS (MALES AND FEMALES) BY AGE OF DEATH.
(Obs=observed deaths; Exp=expected deaths, SMR=standardized mortality ratio)

| | AGE OF DEATH (YEARS) | | | |
|---|---|---|---|---|
| | 15-24 | 25-34 | 35 + | TOTAL |
| | (p.y. 7507)* | (p.y. 14876) | (p.y. 1612) | (p.y. 23996) |
| ALL CAUSES | | | | |
| Obs/Exp | 74 / 6.73 | 139 /13.69 | 26 / 3.24 | 239 / 23.66 |
| SMR | 11.00 | 10.15 | 8.04 | 10.10 |
| Rates (x 1000) | 9.86 | 9.34 | 16.13 | 9.96 |
| ALL NEOPLASMS | | | | |
| Obs/Exp | 3 / 0.62 | 3 / 2.05 | 3 / 0.92 | 9 / 3.59 |
| SMR | 4.85 | 1.46 | 3.27 | 2.51 |
| Rates (x 1000) | 0.40 | 0.20 | 1.86 | 0.37 |
| OVERDOSE | | | | |
| Obs/Exp | 29 / - | 46 / - | 6 / - | 81 / - |
| Rates (x 1000) | 3.86 | 3.09 | 3.72 | 3.38 |
| ENDOCARDITIS | | | | |
| Obs/Exp | 2 / 0.02 | 5 / 0.05 | - / 0.01 | 7 / 0.09 |
| SMR | 89.05 | 92.29 | - | 78.80 |
| Rates (x 1000) | 0.27 | 0.34 | - | 0.29 |
| OTHER HEART DIS. | | | | |
| Obs/Exp | 5 / 0.16 | 5 / 0.41 | 2 / 0.13 | 12 / 0.70 |
| SMR | 31.88 | 12.15 | 15.05 | 17.11 |
| Rates (x 1000) | 0.66 | 0.34 | 1.24 | 0.50 |
| CIRRHOSIS | | | | |
| Obs/Exp | - / 0.62 | 16 / 0.53 | 5 / 0.29 | 21 / 0.88 |
| SMR | - | 30.29 | 17.14 | 23.72 |
| Rates (x 1000) | - | 1.07 | 3.10 | 0.88 |
| INJURIES, POISONING (except suicides) | | | | |
| Obs/Exp | 20 / 3.95 | 19 / 5.90 | - / 0.59 | 39 / 10.44 |
| SMR | 5.06 | 3.22 | - | 3.74 |
| Rates (x 1000) | 2.66 | 1.28 | - | 1.62 |
| SUICIDES | | | | |
| Obs/Exp | 2 / 0.45 | 5 / 1.16 | 4 / 0.13 | 11 / 1.74 |
| SMR | 4.44 | 4.33 | 30.77 | 6.31 |
| Rates (x 1000) | 0.27 | 0.34 | 2.48 | 0.46 |
| AIDS | | | | |
| Obs/Exp | 3 / - | 11 / - | 3 / - | 17 / - |
| Rates (x 1000) | 0.40 | 0.74 | 1.86 | 0.71 |
| PNEUMONIA | | | | |
| Obs/Exp | 2 / 0.07 | 2 / 0.15 | 1 / 0.03 | 5 / 0.25 |
| SMR | 28.87 | 13.31 | 31.25 | 19.88 |
| Rates (x 1000) | 0.27 | 0.13 | 0.62 | 0.21 |

* Person-years of observation

TABLE 6

YEARLY MEAN NUMBER OF DEATHS BY CAUSE (N) OBSERVED AMONG ROMAN RESIDENTS (15-34 YEARS) AND PROPORTION OF DEATHS (%) ATTRIBUTABLE TO INTRAVENOUS DRUG USE IN THE SAME POPULATION, ROME, ITALY 1980-88.

| CAUSE OF DEATH | MALES | | | FEMALES | | |
|---|---|---|---|---|---|---|
| | N | SMR* | % | N | SMR | % |
| ALL CAUSES | 393 | 9.6 | 16.0 | 174 | 20.1 | 6.1 |
| ALL NEOPLASMS | 52 | 2.2 | 2.6 | 45 | 2.4^ | 0.5 |
| ENDOCARDITIS | 3 | 88.2 | 65.8 | 1 | 109.9^ | 27.1 |
| OTHER HEARTH DISEASES | 11 | 15.7 | 24.6 | 5 | 33.6 | 10.0 |
| CIRRHOSIS | 6 | 27.7 | 37.1 | 2 | 19.9^ | 6.1 |
| PNEUMONIA | 5 | 5.2^ | 8.5 | 4 | 110.3 | 27.1 |
| INJURIES (except suicides) | 163 | 3.7 | 5.7 | 41 | 9.2 | 2.7 |
| SUICIDES | 34 | 4.7 | 7.5 | 12 | - | - |

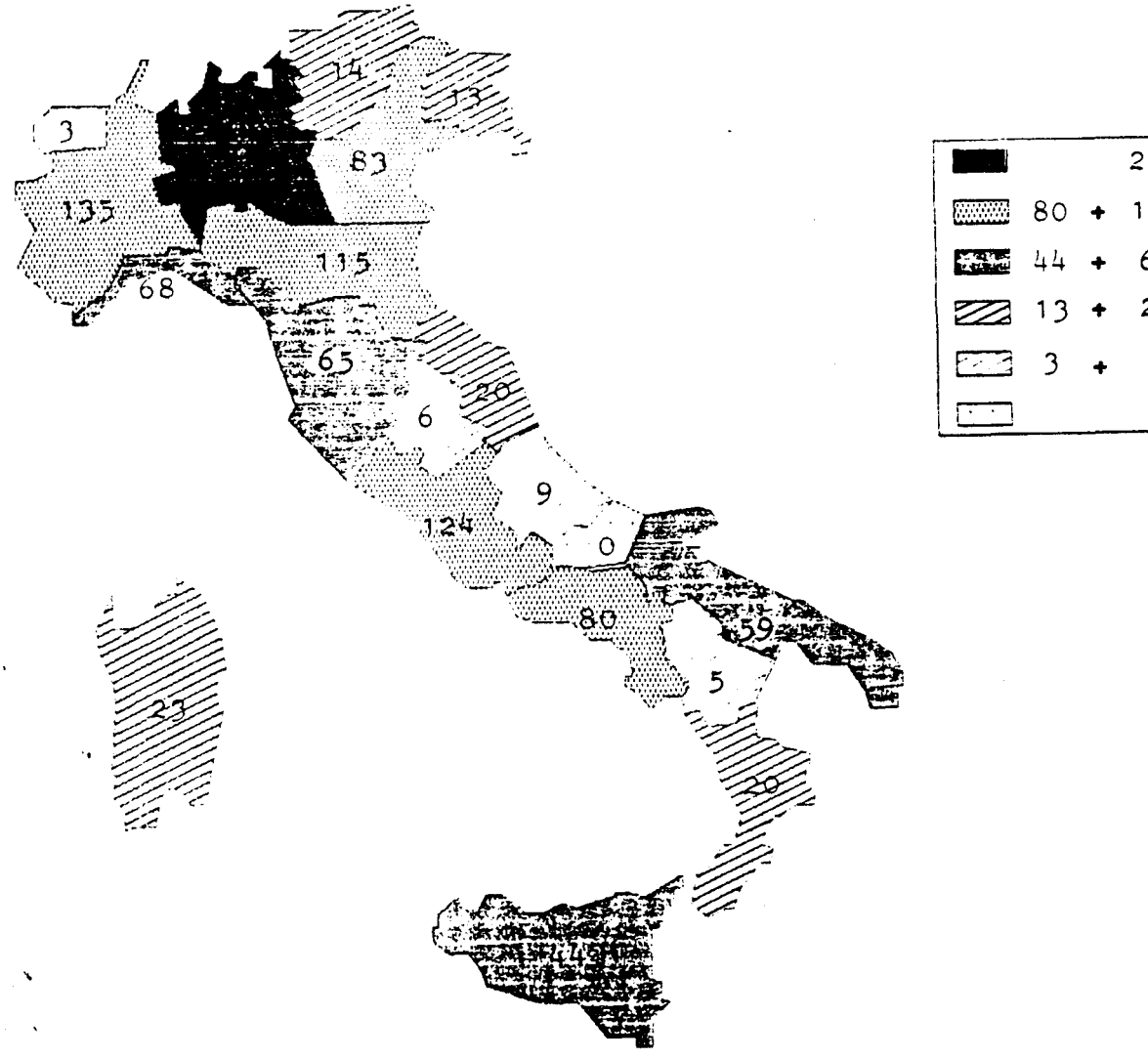
* SMRs were computed as the observed/expected number of deaths in the cohort of IVDUs in the age range 15-34.

^ SMR based on only one case

3. DEATHS OF DRUG USERS IN ROAD ACCIDENTS

| rcumstance of accident | 1970 | | 1979 | | 1988 | |
|---|---|---|---|---|---|---|
| ered Psyco-physic dition of: | Alcohol | Drug | Alcohol | Drug | Alcohol | Drug |
| ver | 12 | 1 | 24 | 1 | 10 | 1 |
| estrian | 3 | - | 1 | - | 1 | - |
| al Road Accidents | 10208 | | 8318 | | 6784 | |

# DECESSI DI ASSUNTORI DI STUPEFACENTI
# - DISTRIBUZIONE REGIONALE - ANNO 1990 -



TAB. DEATHS OF DRUG USERS FOR "PSYCHIC DESEASES", BY AGE

| Age / CAUSE | 1980 >=19 | 20-24 | 25-29 | 30-34 | 35-39 | >=40 | Total | Males | Females |
|---|---|---|---|---|---|---|---|---|---|
| Alcohol Dependency | 0 | 3 | 5 | 12 | 11 | 305 | 336 | 281 | 55 |
| Drug Dependency | 29 | 71 | 41 | 8 | 1 | 2 | 152 | 133 | 19 |
| CAUSE | 1983 >=19 | 20-24 | 25-29 | 30-34 | 35-39 | >=40 | Total | Males | Females |
| Alcohol Dependency | 0 | 2 | 4 | 4 | 17 | 336 | 336 | 309 | 54 |
| Drug Dependency | 45 | 113 | 76 | 18 | 9 | 4 | 267 | 236 | 31 |
| CAUSE | 1987 >=19 | 20-24 | 25-29 | 30-34 | 35-39 | >=40 | Total | Males | Females |
| Alcohol Dependency | 0 | 0 | 4 | 8 | 15 | 244 | 271 | 231 | 40 |
| Drug Dependency | 16 | 105 | 129 | 67 | 20 | 17 | 354 | 304 | 50 |

AGE DISTRIBUTION OF DRUG USERS ATTENDING DRUG DEPENDENCY UNIT IN 1990 COMPARED TO THAT OF THE LAST FIVE YEARS OF AIDS DEATHS

| AGE | N. DRUG USERS | % | % OF AIDS DEATHS |
|---|---|---|---|
| <15 | 44 | 0.1 | - |
| 15-19 | 2970 | 4.5 | 0.2 |
| 20-24 | 19564 | 29.4 | 12.0 |
| 25-29 | 25839 | 38.8 | 44.1 |
| 30-34 | 12195 | 18.3 | 29.5 |
| 35-39 | 4366 | 6.6 | 10.2 |
| 40+ | 1536 | 2.3 | 4.0 |
| TOTAL | 66514 | 100.0 | 100.0 |

DEATHS OF AIDS PATIENT WITH HISTORY OF DRUG USE
BY REGION OF RESIDENCE AND REGION WHERE DEATH HAPPENED

| Region | Freq | Percent | Cum. |
|---|---|---|---|
| 01 | 243 | 6.6% | 6.6% |
| 03 | 1379 | 37.5% | 44.1% |
| 04 | 21 | 0.6% | 44.7% |
| 05 | 195 | 5.3% | 50.0% |
| 06 | 16 | 0.4% | 50.4% |
| 07 | 219 | 6.0% | 56.4% |
| 08 | 373 | 10.1% | 66.5% |
| 09 | 205 | 5.6% | 72.1% |
| 10 | 13 | 0.4% | 72.5% |
| 11 | 49 | 1.3% | 73.8% |
| 12 | 417 | 11.3% | 85.1% |
| 13 | 20 | 0.5% | 85.7% |
| 14 | 3 | 0.1% | 85.7% |
| 15 | 74 | 2.0% | 87.8% |
| 16 | 121 | 3.3% | 91.1% |
| 17 | 11 | 0.3% | 91.4% |
| 18 | 38 | 1.0% | 92.4% |
| 19 | 133 | 3.6% | 96.0% |
| 20 | 131 | 3.6% | 99.6% |
| ES | 12 | 0.3% | 99.9% |
| IN | 4 | 0.1% | 100.0% |
| Total | 3677 | 100.0% | |

| Region | Freq | Percent | Cum. |
|---|---|---|---|
| 01 | 259 | 7.0% | 7.0% |
| 02 | 2 | 0.1% | 7.1% |
| 03 | 1356 | 36.9% | 44.0% |
| 04 | 21 | 0.6% | 44.5% |
| 05 | 191 | 5.2% | 49.7% |
| 06 | 18 | 0.5% | 50.2% |
| 07 | 219 | 6.0% | 56.2% |
| 08 | 415 | 11.3% | 67.5% |
| 09 | 196 | 5.3% | 72.8% |
| 10 | 23 | 0.6% | 73.4% |
| 11 | 47 | 1.3% | 74.7% |
| 12 | 451 | 12.3% | 87.0% |
| 13 | 21 | 0.6% | 87.5% |
| 14 | 3 | 0.1% | 87.6% |
| 15 | 66 | 1.8% | 89.4% |
| 16 | 116 | 3.2% | 92.6% |
| 17 | 8 | 0.2% | 92.8% |
| 18 | 18 | 0.5% | 93.3% |
| 19 | 120 | 3.3% | 96.5% |
| 20 | 127 | 3.5% | 100.0% |
| Total | 3677 | 100.0% | |

| | Code |
|---|---|
| PIEMONTE | 01 |
| VAL D'AOSTA | 02 |
| LOMBARDIA | 03 |
| BOLZANO | 04 |
| TRENTO | |
| VENETO | 05 |
| FRIULI V. G. | 06 |
| LIGURIA | 07 |
| EMILIA ROMAGNA | 08 |
| TOSCANA | 09 |
| UMBRIA | 10 |
| MARCHE | 11 |
| LAZIO | 12 |
| ABRUZZO | 13 |
| MOLISE | 14 |
| CAMPANIA | 15 |
| PUGLIA | 16 |
| BASILICATA | 17 |
| CALABRIA | 18 |
| SICILIA | 19 |
| SARDEGNA | 20 |

DEATHS OF AIDS PATIENT WITH HISTORY OF DRUG USE
BY YEAR, AGE, SEX

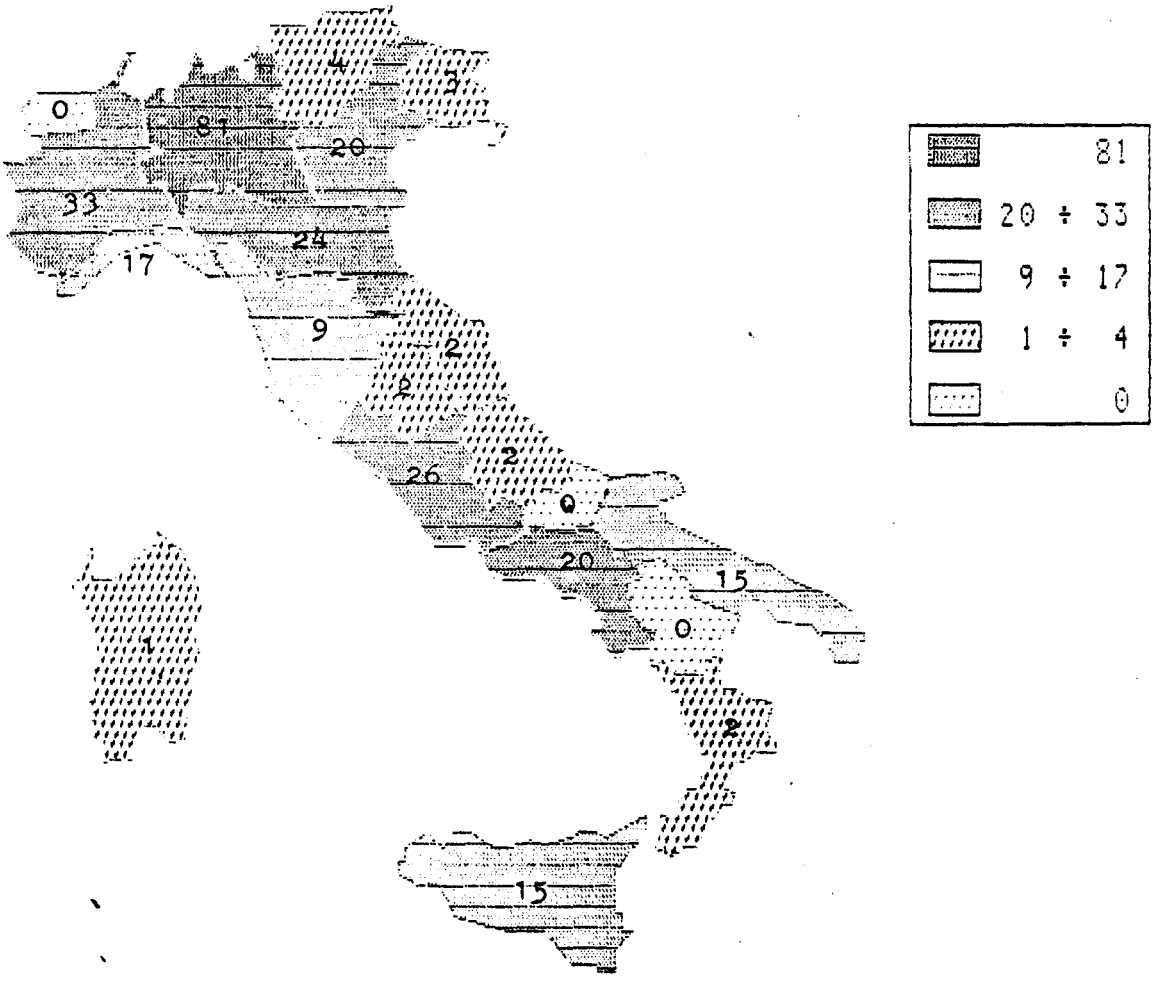
| YEAR | Freq | Percent | Cum. |
|---|---|---|---|
| . | 5 | 0.1% | 0.1% |
| 84 | 6 | 0.2% | 0.3% |
| 85 | 50 | 1.4% | 1.7% |
| 86 | 162 | 4.4% | 6.1% |
| 87 | 359 | 9.8% | 15.8% |
| 88 | 556 | 15.1% | 30.9% |
| 89 | 815 | 22.2% | 53.1% |
| 90 | 1048 | 28.5% | 81.6% |
| 91 | 676 | 18.4% | 100.0% |
| Total | 3677 | 100.0% | |

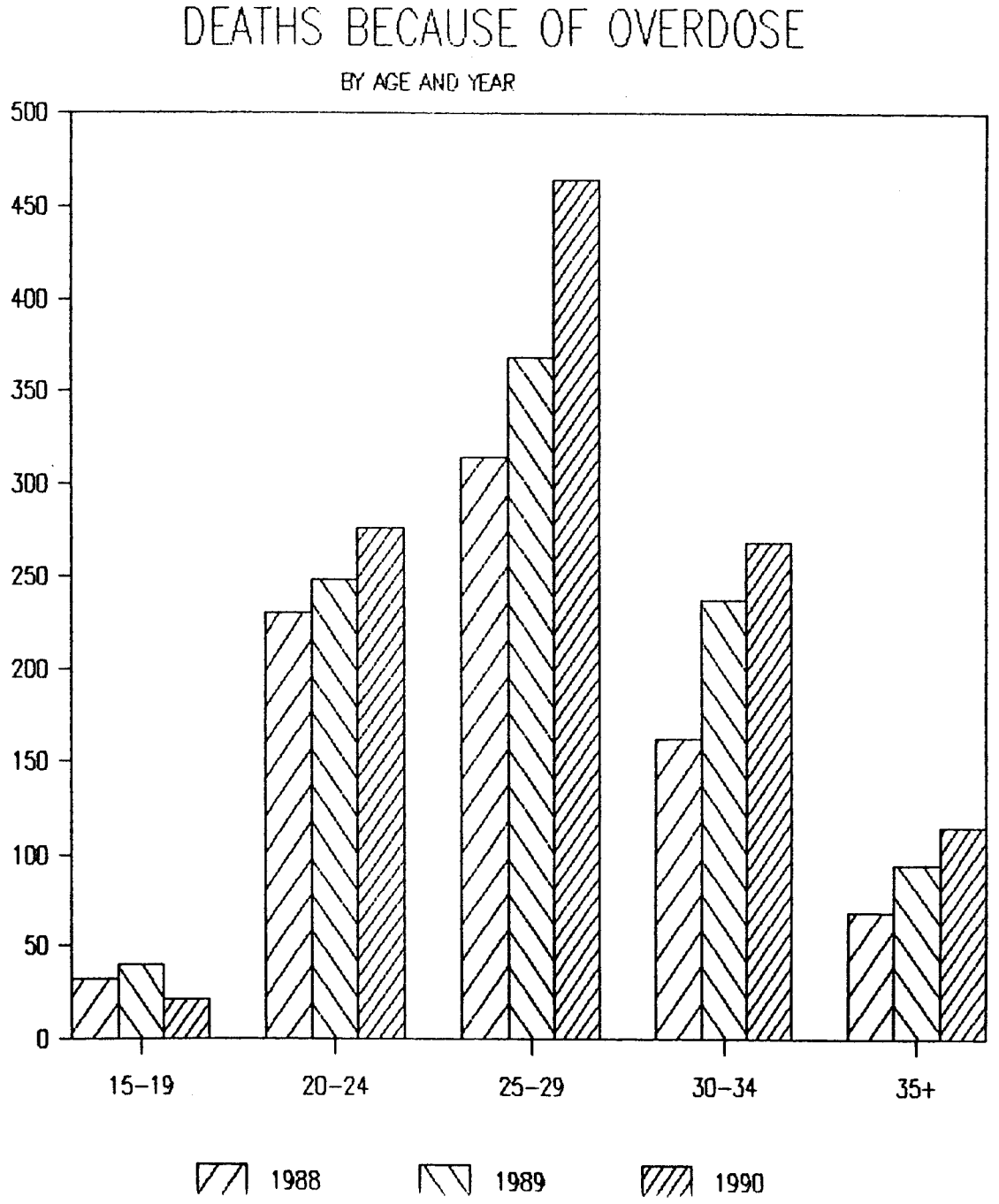
| SEX | Freq | Percent | Cum. |
|---|---|---|---|
| M | 2965 | 80.6% | 80.6% |
| F | 712 | 19.4% | 100.0% |
| Total | 3677 | 100.0% | |

| AGE | Freq | Percent | Cum. |
|---|---|---|---|
| 15-19 | 6 | 0.2% | 0.2% |
| 20-24 | 443 | 12.0% | 12.2% |
| 25-29 | 1623 | 44.1% | 56.4% |
| 30-34 | 1083 | 29.5% | 85.8% |
| 35-39 | 375 | 10.2% | 96.0% |
| 40-44 | 103 | 2.8% | 98.8% |
| 45-49 | 30 | 0.8% | 99.6% |
| 50-54 | 7 | 0.2% | 99.8% |
| 55-59 | 5 | 0.1% | 99.9% |
| 60-64 | 2 | 0.1% | 100.0% |
| Total | 3677 | 100.0% | |

| AGE | 1 | 2 | Total |
|---|---|---|---|
| 15-19 | 4 | 2 | 6 |
| 20-24 | 307 | 136 | 443 |
| 25-29 | 1292 | 331 | 1623 |
| 30-34 | 914 | 169 | 1083 |
| 35-39 | 324 | 51 | 375 |
| 40-44 | 88 | 15 | 103 |
| 45-49 | 25 | 5 | 30 |
| 50-54 | 7 | 0 | 7 |
| 55-59 | 2 | 3 | 5 |
| 60-64 | 2 | 0 | 2 |
| Total | 2965 | 712 | 3677 |

DECESSI DI ASSUNTORI DI STUPEFACENTI
- DISTRIBUZIONE REGIONALE - ANNO 1986 -




DEATHS BECAUSE OF OVERDOSE
BY AGE AND YEAR
500
450
400
350
300
250
200
150
100
50
0
15–19
20–24
25–29
30–34
35+
1988
1989
1990

# DRUG RELATED DEATHS: UNITED KINGDOM STATISTICS

## Introduction

The compilation of national statistics on drug related deaths is still under development in the United Kingdom. More detailed figures have been published in the last year but work is continuing on refining the methods used to identify the relevant deaths. This report covers the statistics published earlier this year.

## Background

There are two series of drug related deaths in the United Kingdom. One attempts to cover all deaths arising from the adverse effects of controlled drugs (eg overdose) - called the national drug related deaths series in this report. The other is restricted to deaths of persons who have at some time been declared by a doctor to be addicted to one of 14 notifiable drugs (mainly opiates) - called the drug addict deaths series in this report. In future years it is intended to identify within the first series the deaths which are also included in the second series.

### National drug related deaths series

Up until 1991 the only regularly published national statistics on drug related deaths were:

(a) total numbers of deaths coded to each of ICD codes 304 (drug dependence) and 305 (non-dependent abuse of drugs); with limited information on the drug type (the 4th digit); published separately for England and Wales, Scotland, Northern Ireland.

(b) numbers of verdicts at Coroners' inquests where death was attributed to dependence on drugs or non-dependent abuse of drugs; a subset of (a); available for England and Wales only.

These statistics did not cover all drug related deaths because, for example, many deaths from illicit drug overdoses are classed as accidental deaths in the systems from which (a) and (b) are drawn.

Other statistics were available that came closer to the definition of drug related deaths but these were unsatisfactory from the point of view of national coverage. For example, some came from in-depth studies of particular areas while others were based on non-representative groups of the population (eg opiate addicts previously recorded on a central register).

It was decided to try and broaden the base of the statistics. The initial approach taken was to use statistics already collected nationally and extract from these a subset that were related to controlled drugs. It is recognised that the deaths included in the selected subset are not all related to illicit drug use and that some drug related deaths (eg those resulting

from trauma) are omitted. It is hoped to refine the analysis in future years.

Mortality statistics for the United Kingdom are collected in three places using the system for registration of deaths. The three places are the Office of Population Censuses and Surveys for England and Wales, the General Register Office for Scotland and the General Register Office for Northern Ireland. In this report they are referred to as the three area offices.

## Drug addict deaths series

The United Kingdom has a system whereby all opiate addicts seen by doctors are supposed to be notified centrally. The date and cause of death of persons previously notified are recorded on the system. Statistics have been compiled for several years but not published on a regular basis. A series of tables were published in 1991 and it is intended to update these annually.

The data from this series indicate that almost half of addicts were aged under 30 at death. Drugs caused or were implicated in the deaths of around 60 per cent of addicts. These were mainly overdose deaths, about three-quarters of which involved opiates or methadone.

A *National Drug Related Deaths Series*

**I Definitions actually used in each country**

a) Definitions

For national statistical purposes drug related deaths currently include the following causes:

combined in tables)

(i) drug dependence;

(ii) non-dependent abuse of drugs (excluding alcohol and tobacco);

(iii) poisoning where a drug controlled under Schedule 2 of the Misuse of Drugs Act 1971 (ie controlled drug) was mentioned;

(iv) AIDS (injecting drug users) .

Notes: Group (iii) includes some deaths not related to illicit drug use (eg some benzodiazepine overdoses).
On the whole, deaths (particularly those resulting from trauma) indirectly related to illicit drug use are not included.

b) Sources of available data

The statistics a) (i) to (iii) are currently drawn from extracts of deaths certificates supplied to the three area offices. More detailed information could be obtained from records held by the Coroner (England, Wales and Northern Ireland) and the Procurator Fiscal (for Scotland) who are responsible for establishing the cause of death but this source has not been used in the current analysis. The statistics a) (iv) come from the national surveillance system for HIV/AIDS which relies in part on information from the three area offices.

c) Is there a distinction between different causes of drug related deaths?

Each of (i)-(iv) is separately enumerated. Within a) (iii) a distinction is made between accidental deaths, suicides and the rest (undetermined).

d) Are there regional differences in terms of definitions?

No, all three area offices use common definitions based on ICD codes. Scotland does not use ICD nature of injury codes 800-999 but uses condensed codes in conjunction with external cause codes E800-E999. However whether a death is assigned to group a)(i), (ii) or (iii) may depend on local practice.

e) Is the International Classification of Diseases in use?

Yes, the 9th Revision is used as follows:

| Group | ICD |
|---|---|
| a)(i) | 304 |
| a)(ii) | 305.2-305.9 |

a)(iii) 960-979, also coded as E850-E866 (accident)
E950 (suicide)
E980 (undetermined)
filtered on controlled drugs. Only E codes used in Scotland but separate record kept of drugs involved.
Group a)(iv) does not correspond to any one ICD code.

**II Available data**

**a) Are deaths automatically screened for illicit drugs, alcohol and/or licit drugs?**

No.

**b) If not, under what circumstances is there such a screening?**

There are no clear rules on this. Full toxicological analysis is expensive and handling specimens from drug users needs special care. In some areas there may be a substantial delay between asking for a full analysis and receipt of the results. For all these reasons screening is likely to be restricted to as small a number of deaths as possible.

In England, Wales and Northern Ireland all violent and unnatural deaths and deaths of which the causes are either unknown or are in serious doubt and all deaths of persons in custody are reported to the coroner. The coroner's job is to establish the cause of death. The coroner will usually have a post-mortem carried out to determine the medical cause of death. This would not necessarily involve screening of body fluids for drugs etc. Circumstantial evidence (eg analysis of pills, contents of syringes) may be considered sufficient where the death was by overdose or there was evidence of drug use past or present. There is even less likely to be screening for drugs when death occurred from a disease or accident unconnected with drug use and there was no previous history of drug taking. The coroner will also hold an inquest if, after the initial investigation, it appears that the death was not due to natural causes. The holding of an inquest requires the coroner not only to ascertain the medical cause of death but also to determine how, when and where the deceased came by his or her death. It may only be at this stage that evidence of drug use becomes available through statements made by the police, friends etc. The coroner is responsible for registering the cause of deaths reported to him. For drug related deaths a post mortem and inquest will normally have taken place before registration of the cause of death.

The Procurator Fiscal in Scotland performs a similar role to that of the coroner. In Scotland a medical certificate of the cause of death must be sent to the registrar within 7 days of the death. It is the registrar's job to notify violent deaths or deaths from an unexplained or suspicious cause to the Procurator Fiscal who is responsible for enquiring into the cause of such deaths.

In both areas, when the death form indicates that a post mortem

is proposed the information from the autopsy report is used for statistical purposes in coding the cause of death.

c) What is the basis on which the drug or drugs are identified?

The drugs may be identified by analysis of material from the scene of death or through toxicological analysis of body fluids. The standard of the toxicological analysis may vary. Once a death is registered the details appearing on the death certificate are used to code the cause of death; if insufficient information appears (eg unspecified drugs are mentioned) the area offices will try to obtain more details. If more than one drug is mentioned a decision has to be made about the most important one. For a)(i) and (ii) the drugs are identified according to the 4th digit of the ICD code (eg 3040 deaths from dependence on morphine type drug). For a)(iii) all drugs mentioned on the death certificate are listed from which the controlled drugs are identified.

Data

Requested for 1970-1990 for 1) all ages and 2) ages 15-39 to show the specific drugs, age, gender, region ,cause of death. Please note that

(1) Our tables show 1979-1989. Data for Ia)(iii) which are labour intensive to collate have been extracted for 1988 and 1989 only.
1990 tables will be available in early 1991.
1970-1978 data could be extracted for I(a)(i) and (ii). (iv) is zero) but it is unlikely that a)(iii) will be prepared for earlier years.

(2) 15-39 is not an age group currently identified separately. Statistics for I a)(i)(ii) and (iv) but not a)(iii) could reasonably easily be produced for this age group.

(3) No regional breakdown produced at present.

Please refer to enclosed bulletin Statistics of the Misuse of Drugs: Addicts Notified to the Home Office, United Kingdom 1990 Issue 8/91 and the following tables:

Table 16 summary, cause of death
17, 18, 19 nature of the drug(s)
18, 19 age
17, 19, 20 gender

Suicides and traffic accidents (drug related deaths).

Table 19 covers suicide by poisoning. Other suicides are not included. Traffic accidents are not included in drug related deaths but a research study in 1985-87 revealed very low incidence of drugs in road user fatalities in England and Wales. Amongst all classes of road user the proportion of cases where

drugs likely to affect the central nervous system had been taken was 7.4 per cent; in approximately two thirds of this total, medicinal drugs had been used; drugs of abuse, notably cannabis, were detected in 2.5 per cent of cases.

B Drug Addict Deaths Series

I **Definitions actually used in each country**

a) Definitions

Death of a person previously notified to the Home Office Addicts Index.

The Misuse of Drugs (Notification of and Supply to Addicts) Regulations 1973 require doctors to send to the Chief Medical Officer at the Home Office particulars of persons whom they consider to be addicts to any of the following 14 controlled drugs:

cocaine, dextromoramide, diamorphine, dipipanone, hydrocodone, hydromorphone, levorphanol, methadone, morphine, opium, oxycodone, pethidine, phenazocine and piritramide.

b) Sources of available data

Information on deaths of previously notified addicts is received from several sources. The most important one is the National Health Service Central Register. All new addicts are flagged on this record system. When the person dies a copy of the death certificate is sent to the Home Office.
Other sources are copies of death certificates where the underlying cause was related to dependence on/abuse of drugs or opiates or addiction were mentioned (extracted by the three area offices); reports from doctors, police, coroners; press cuttings.

c) Is there a distinction between different causes of drug related deaths?

Yes. We code deaths, in descending order of priority, to

suicide
homicide
overdose (includes any mention of drugs with intoxication, poisoning, inhalation of stomach contents, asphyxia, respiratory failure)
AIDS/HIV
drug addiction/suspected drug related (any other mention of drugs or inhalation of stomach contents)
accident
natural causes
unknown

d) Are there regional differences in terms of definitions?

No.

e) Is the International Classification of Diseases in use?

No.

**II Available data**

a) Are deaths automatically screened for illicit drugs, alcohol and/or licit drugs?

No.

b) If not, under what circumstances is there such a screening?

See explanation for national drug related deaths series.

c) What is the basis on which the drug or drugs are identified?

See explanation for national drug related deaths series.
Using the details provided on the death certificate, only the 14 notifiable drugs are separately identified in the codes. Other drugs are coded either as "other controlled" (if they are controlled under Schedule 2 of the Misuse of Drugs Act 1971) or as "other". Only two drugs are coded. If more than two drugs are mentioned the priority order is as follows:

Diamorphine (heroin)
Methadone
Dipipanone
Cocaine
Morphine
Pethidine
Dextromoramide
Levorphanol
Hydrocodone
Oxycodone
Phenazocine
Piritramide
Hydromorphone
Opium or unspecified opiates
Other controlled drugs
Other drugs

Available data

Requested for 1970-1990 for 1) all ages and 2) ages 15-39 to show the specific drugs, age, gender, region ,cause of death. Please note that

(1) Our tables show 1979-1989.
1990 tables will be available in early 1991.

(2) 15-39 is not an age group currently identified separately but his could be done relatively easily.

Please refer to enclosed bulletin Statistics of the Misuse of Drugs: Addicts Notified to the Home Office, United Kingdom 1990 Issue 8/91 and the following tables:

Table 12 age and gender
13 cause of death
14 nature of the drug(s)

A12 region

Suicides and traffic accidents (drug related deaths).

Table 13 covers suicide and accidents. Traffic accidents are included in accidents and are not separately identified.

**National data**

Total deaths aged 15-39 by gender, for all causes, traffic accidents, and suicides for years 1979-89.

See Annex A1 for England and Wales, Annex A2 for Scotland.

National demographic data for years 1979-89:

1) total population by gender and age: see Annex B1 for England and Wales, Annex B2 for Scotland.
2) population aged 15-39 by gender: see Annex C1 for England and Wales, use Annex B2 for Scotland.

AIDS: Please refer to enclosed bulletin Statistics of the Misuse of Drugs: Addicts Notified to the Home Office, United Kingdom 1990 Issue 8/91 table 20. Not yet extracted for ages 15-39.

## III Description of data collection

National drug related deaths series groups a) (i)-(iii) and drug addicts deaths series.

Please refer to enclosed documentation on registration of deaths in England, Wales and Scotland and answer to II b) above.
In summary the essential steps are that

i) on occurrence of death from natural causes, a medical practitioner is required to give a medical certificate of cause of death (in England and Wales the practitioner must have attended the deceased person in their last illness otherwise the coroner must be informed of the death, in Scotland another practitioner can sign the certificate);

ii) deaths not due to natural causes

in England, Wales and Northern Ireland are certified by a coroner who may be notified nominally by registrars, but usually directly by doctors or other persons in attendance at sudden deaths, for example, the police

in Scotland are still certified by a medical practitioner but are also referred to a Procurator Fiscal by registrars, doctors or the police;

The majority of deaths involving drugs will be referred to a coroner or procurator fiscal.

iii) when a death is certified by a coroner the coroner supplies the cause of death. This is copied onto the death draft (see enclosed documentation) and sent to the area office for analysis. In Scotland the final cause of death takes account of the pathologist's report. So the information on cause of death takes account of the results of any post-mortem or inquest.

iv) coroners (and registrars in Scotland) also provide other information to the area offices, via the registration service. This is used for statistical purposes (coding) and is subject to various confidentiality constraints such that only some of it may be released for medical research purposes.

(v) All the information is used to code the underlying cause of death to the relevant ICD codes. If the information implies drug dependence or non-dependent abuse of drugs, ICD codes 304 and 305 are used. Without such evidence, deaths are assigned to external causes in accordance with international rules for underlying cause of death. This uses the alphabetical index to drugs given at the end of ICD9. When a drug is mentioned in any of the information supplied by the coroner, two codes are assigned:

a. and external cause (E) code, depending upon

whether the death was an accidental poisoning, suicidal poisoning or poisoning undetermined whether accidental or intentional.

b. a Chapter XVII (Injury and Poisoning) code.

In Scotland only a. above is used.

Comment: It appears that similar circumstances can give rise to inquest verdicts of dependence on drugs, non-dependent abuse of drugs or accident. Practice may well vary across the country and over time. Similarly, when it comes to statistical analysis the amount of detail available to the coder varies, affecting the ICD code to which the death is assigned.

National drug related deaths series group a) (iv)

Voluntary reporting schemes exist for both AIDS cases and known HIV-1 infections. All AIDS case reports are assessed against the current internationally agreed surveillance case definition of AIDS. Information is collected (see enclosed form) on risk factors such as drug injecting. Information on deaths from AIDS is collected in a number of ways. It may be recorded on the notifying form, the clinician may send a letter to the surveillance centre about a previously notified case, it may be picked up from scrutiny of death entries extracted by the three area offices, or by follow-up of AIDS cases not known to be dead.

## IV Description of past and present drug related deaths research/studies in UK

There have been many studies but the majority are not nationally-based. Some drug indicator studies for small areas give an indication of the number of deaths by detailed study of coroners records. There is an ongoing study of coroners records in Inner London (J Harvey) the results of which are sometimes used by other London studies. There have been several studies of deaths of previously notified addicts using the records held by the Home Office (the most recent data is in the enclosed statistical bulletin).

Attached are :

i) list of references from the Morbidity and Mortality chapter of Drug Problems in Britain: A Review of Ten Years (these are mostly from the 70s);

ii) a selected list of references from a search of ISDD's library (these are mostly from 1985 onwards).

References not included in the above are:

Everest J T, Tunbridge R J and Widdop B (1988). The incidence of drugs in road accident fatalities. Research Report RR202. Transport and Road Research Laboratory, Crowthorne, England.

Ghodse A H, Sheehan M, Taylor C, Edwards G (1985). Deaths of drug addicts in the United Kingdom 1967-81. Br.Med.J., 290, 425-428.

Harvey J G (1981). Drug-related mortality in an inner city area. Drug and Alcohol Depend., 7, 239-247.

Home Office. Statistics of deaths reported to coroners, England and Wales (published annually). Research and Statistics Dept, Home Office, London.

Home Office. Statistics of the misuse of drugs: addicts notified to the Home Office, United Kingdom, 1990. Research and Statistics Dept, Home Office, London.

Spear H B (1983). Drug abuser deaths. Br J Addict., 78, 173-178.

## V and VI Analysis of problems raised by available data/conclusion

Currently we do not identify every death which is the direct or indirect result of illicit drug use. Both our series have deficiencies as identified below.

National drug related death series

The main problems with the national analysis of drug related deaths are that

(1) it does not include every drug related death (eg road traffic accidents) and it includes some deaths (eg suicides where dextropropoxyphene was mentioned) which are not necessarily the result of illicit drug use.

(2) death certificates provide inadequate detail to correctly detect drug related deaths.

The analysis has been done this way for simplification and ease of production. A more accurate result could only be obtained with a lot more effort. One approach would be to identify all death certificates which mentioned any controlled drug and conduct further enquiries of coroners or their equivalent regarding these deaths. Another approach would be to regularly screen coroners' records to identify likely drug related deaths for detailed follow-up and confirmation. It is likely that a combination of these two approaches would be required. Further investigations would be required to establish the methods of reliably identifying the majority of drug related deaths.

Drug addict deaths series

The main problems with the drug addict deaths series are that:

(1) it relates to only part of the drug misusing population (ie opiate addicts who have presented for treatment and been notified)

(2) some deaths may be missed.

Nevertheless, assuming that (2) is not a large problem, it is a useful dataset because it gives an idea of the typical causes of death for this group (approximately 60% are drug related) and the proportion who die within specified time intervals.

Conclusion

The most appropriate way to improve the quality of available data would be to concentrate on refinements to the national drug related deaths series. This requires further study of the way these deaths are dealt with by coroners and development of methods of reliably identifying the deaths of interest.

## VII Attachments

Home Office Statistical Bulletin Issue 8/91.
National statistics (Annexes A1, A2, B1, B2 and C1)
Death certificate and registration form used in England and Wales, with guidance.
Death certificate and registration form used in Scotland, with guidance.
Form used to record AIDS cases.
Lists of references.

**Commission of the European Community**

**IREP (Dr. Ingold)**

**Paris, 25./26. October 1991**

First I would like to excuse Professor Püschel, who cannot come to this meeting. He has other obligations which he cannot displace.

I want to orientate my short report to the questionaire from Mr. Ingold, he send us earlier this year.

## I. Actually used definition of drug-death in FRG

In Germany a special working group of the Federal Criminal Police Office ("Bundeskriminalamt" in Wiesbaden) has designed the definition of drug-death wich is also used in departments of legal medicine and for official statistics. All deaths were obligatory registrated as drug related death, where the causal connection to drug addiction (illicit drugs or substitutes) is evident:

1. Death due to intentional or accidential overdose.

2. Death due to long-term abuse of drugs (myocarditis, hepatitis, liver cirrhosis, AIDS).

3. Suicides connected with drug addiction (hanging, shooting, jumping from the height).

4. Fatal accidents influenced by drugs (traffic accidents, fall from the height, fire and carbon monoxide intoxication).

In the FRG a drug is defined by the Narcotics Act (Betäubungsmittelgesetz). The term "narcotic" is purely a juristic nomen. It is not identical with pharmacological or medical terminology and can be changed by decrees of the national parliament.
There are no regional differences in terms of the definition. The International Classification of Diseases is used.

II. Available data.

In Germany every corpse has to be examined by a medical doctor post mortem. A physician exposes a death-certificat and has to notice the cause of death and signs of external violence and intoxication such as traces of injection. He has to classify the death as "natural" ,"not natural" or "unknown death". If the death is not natural or cause is unknown, the police have to investigate the body and the circumstances of death and the Public Prosecutor seizes the corpse and orders to bring it to the department of legal medicine. The police notices the scene and looks for used syringes, sooty spoons and small heroin-packets in the surroundings. Additionally the police have a look at the criminal-registrations to discover, if the dead person is known as a criminal or for instance as drug-addict or illicit drug-owner. They send a report to the Public Prosecutor who has

to decide, wether an autopsy has to be performed..

In Germany official statistic has a distinction between different causes of drug related deaths according to the above mentioned definition. But statistics suffer from serious misadvantages: in only some areas they are based on the results of regular autopsies and toxicological investigations. Many deaths supposed as suicide, accident, internal disease or overdosage, for instance with bounded arm and fixing-utensils, are not autopsied so that the detailed tissue alterations and toxicological findings are not evaluated. From the scientific point of view the classification as drug related death or not is not straight.

In our material of nearly 500 cases the following causes of death of drug victims could be diagnosed during the last 10 years: intoxication 70 %, "natural" death 10 %, external violence 20 %. Fatal intoxication with heroin alone is dominating nowadays. The most common infections in drug addicts are hepatitis, myocarditis, pneumonia and HIV-infection. The HIV-1-prevalence among drug deaths has decreased within the last years to less than 10 % in Hamburg. External violence includes suicides, for example by hanging, drowning or accidents involving a fall from a height, fire in the flat or traffic accidents.

The percentage of acute intoxications by heroin in Hamburg has steadily increased. In 1987 about 70 - 80 % of the drug deaths died by intoxication with heroin. Mixed intoxications especially of heroin with alcohol, barbiturates and benzodiazepines form

the next bigger group. The situation in Hamburg reflects the situation for the FRG as a whole. Death cases by cocaine - most after i.v.-injections - are relatively seldom.

As you see, there is no autoptical or toxicological screening for illicit drugs in not natural deaths but a system of individual investigation of death-cause in order of the Public Prosecutor. He also decides, whether the drug in the corpse has to be identified by laboratory investigations. If the police find drug-utensils, they make an analysis in their own laboratory to find out the kind of drug and the purity.

## III. Description of data collection

A death is classified as drug related, if the criminal police office of the country has a valid hint, that an abuse of drugs, defined in the Narcotics Act, is causal connected with the death. The criminal police are supplied with a report of autopsy and toxicology from the department of legal medicine, if the Public Prosecutor ordered this investigations. A valid hint is also to find the corpse with traces of injection and fixing-utensil or to know him as drug-addict by the police. The frequence of autopsies is rather low in some regions; in other regions like Hamburg we have an autopsy-rate of nearly 100 % in cases when the criminal police have a suspicion of drug-involvment in the cause of death.
In Hamburg we have special scientific interest in drug related fatalities. That's why every not natural death of persons under

the age of 40 years is investigated for hints towards drug addiction. We have a very close cooperation with the drug squard of the police. in other cities however the police and the forensic pathologists make less efforts to find out every fatality related with drug addiction.

The criminal police have a form to registrate drug related deaths and announce them to the Federal Criminal Office in Wiesbaden. The criminal offices of the countries and the Federal Criminal Office will have a statistical analysis by age, sex, nationality, occupation, consumed drugs and duration of drug abuse, finding place and numbers itemisated to special regions.

Since 1970 the drug deaths are centrally registred. In West-Germany we have a steady increase until 1979 when over 600 drug victims were counted. After 1979 the number of drug deaths decreased to 300 to 500 annually and increased dramatically since 1987 to 991 in 1989 and 1491 in 1990. During the whole period of investigation male drug addicts predominate in Germany. The sex distribution [is nearly by 4.7 :1 ~~has changed from 4.9 : 1 to 2.6 : 1 between 1975 and 1985~~.] The average age of drug victims increased during the last two decades from 25 years to approximately 30 years.

A comparison between different regions in the FRG shows the rate of drug deaths per million people differ widely. Especially high rates can be found in the city states of Hamburg and Bremen and in Berlin and Frankfurt.

IV. Description of past and present drug related death research and studies in FRG.

Hamburg, Berlin und Bremen are involved in a multicenter study supported by the Federal Ministry of Health raised at 1st of july 91 till end of june 92. All drug related deaths in this three countries are investigated by autopsy, serology and toxicology. Additionally psychologists and social scientists contact near relatives (parents, lifepartners), friends and therapeutic institutions with a standardised question-form. In Hamburg and Bremen we will also investigate 450 drug-emergencies by toxicology, serology and with a social-medical questionary. It is our aim, to examine, if special situations in life, drug-career or of health correspond to special types of drug related death (overdosage, suicide). Additional we want to know, if drug related death has other conditions as drug-emergencies. The order of the ministery is, to find recommandations for preventiv care.

V. Problems raised by data collection and by available data.

There are no data from East-Germany of the past twenty years. At the moment, we ask all departments of legal medicine in the new federal countries to give us the available data. Up to now the institutes in Rostock, Halle, Dresden and Potsdam have answered. Within the last year their have only been four drug related fatalities in these regions. We think that a part from Eastern-Berlin there have been less than ten drug deaths in the former

GDR since the unition.

The definition of the Bundeskriminalamt has been worked out in 1979. During the seventies only cases with obvious overdosage registered. That's why comparison of data from the two decades has to be done very carefully.

The chemical investigation procedures became much more effective during eighties. Therefor data concerning the consumed drugs (especially opiates, cocaine, hashish and certain substitutes) are not comparable.

The main problem is the question of unknown cases that cannot be classified because unexperienced doctors don't notice hints to intravenous drug addition and classify fatalities as natural death. A special problem is for example that many doctors in hospitals declare deaths caused by AIDS as "natural" so that we have no further investigation if they are drug addicts.

# P R E L I M I N A R Y  R E P O R T

# O N

# D R U G  R E L A T E D  D E A T H S

# I N  G R E E C E

B Y

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# A N S W E R S  T O  T H E "Q U E S T I O N N A I R E"

## ON DRUG RELATED DEATHS

### I. DEFINITIONS ACTUALLY USED IN GREECE

I.a. DEFINITIONS: The international statistical classification of diseases, injuries and causes of death, 9th amendment, has been put into practice since 1980, but the 8th one had been in use since 1968.

Thus, we can see: a) 303-305, for cases under mental disorders including: alcohol dependence syndrom 303
drug-pharmaceutical-dependence 304
non-dependent drug abuse 305.

b) 965-970, including: 965 analgetics (opiates)
966 antiparkinson agents
967 barbiturates
968-969-970 several others.

In practice, we face cases of death from 1) overdose
2) complications of drug intake, e.g. pneumonia, embolism, etc.
3) suicidal situations, direct or indirect.
4) traffic accidents indirectly and
5) homicide cases, under the influence.

I.b. Sources of available data.

The I.S.C.D.J.C.D., 9th amendment, as well as the police authorities and the forensic services.

I.c. Is there a distinction between different causes of drug related deaths?

Yes, when we follow the above and we can refer to them as direct and indirect, as it is mentioned at the IREP introduction.

I.d. Are there regional differences in terms of definitions?

If any, the regional differences may be attributed to the different concept of the W.H.O. standards concerning the death definitions. Finally, due to the National Statistical Service, the above definitions are followed.

I.e. Is the International Classification of Deseases in use?

Yes, as it is already mentioned above.

II. AVAILABLE DATA.

II.a. Are deaths automatically screened for illicit drugs, alcohol and/or licit drugs?

No, they are not screened as such.

II.b. Under what circumstances is there such a screening?

The Ministry of Public Order, due to the system of compiling data, has the final lists of deaths in which the total number of deaths, the age, sex, citizenship, region, family status, profession, education and the natuer of drug involved are screened, based on information sheets sent by the police stations to the Ministry all over the country.

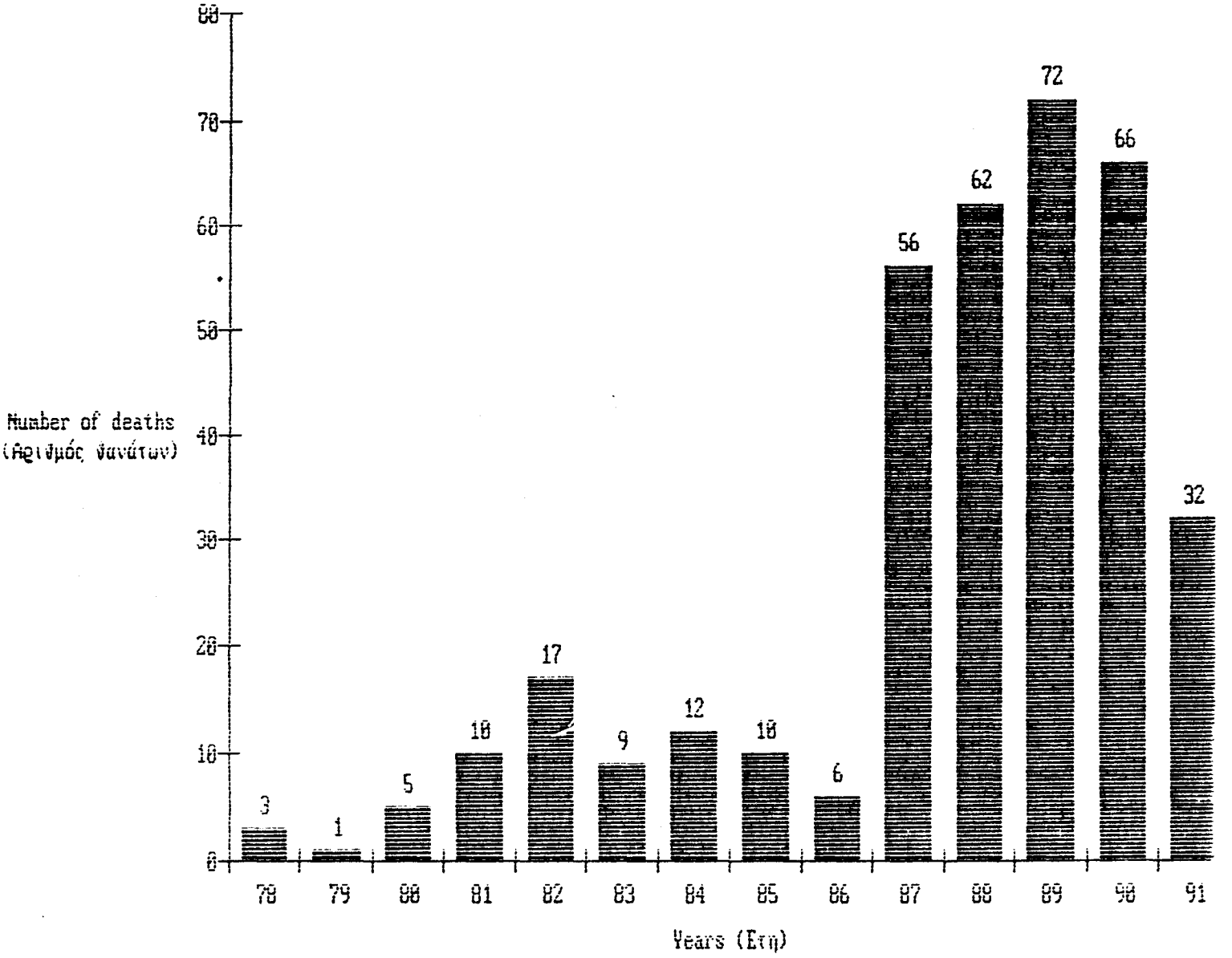
The National Statistical Service has lists of deaths occuring all over the country based on a special report by the registries issued monthly to the Central Byreau.

The department of Statistical Service of the Ministry of Health, Welfare and Social Services covers the cases of death from hospitals only.

II.c. What is the basis on which the drug or drugs are identified in D.R.D.

Drug related death has not been yet defined as an independent system of registration.

Table IX : Total number of deaths due to Drug Abuse from 1978 to 1991 (data collected by the police department ,Athens,Greece)
(Συνολικός αριθμός θανάτων για έτη 1978-1991)



# D R U G  R E L A T E D  D E A T H S
## B Y  A G E S  UP TO 30

1978-1986 TOTAL NUMBERS ARE AVAILABLE ONLY

| | |
|---|---|
| 1987 | 37 |
| 1988 | 50 |
| 1989 | 55 |
| 1990 | 36 |
| 1991 | 19 |

NOTE: Data collected by the Police are registered by age groups as follows: Up to 20 years old, 21-30 and 31 and up, probably due to the fact that deaths over 30 are rare and at least less frequent than the age group of 21-30.

Table VIII : Type of Drug distribution
(Κατανομή είδους ναρκωτικού)

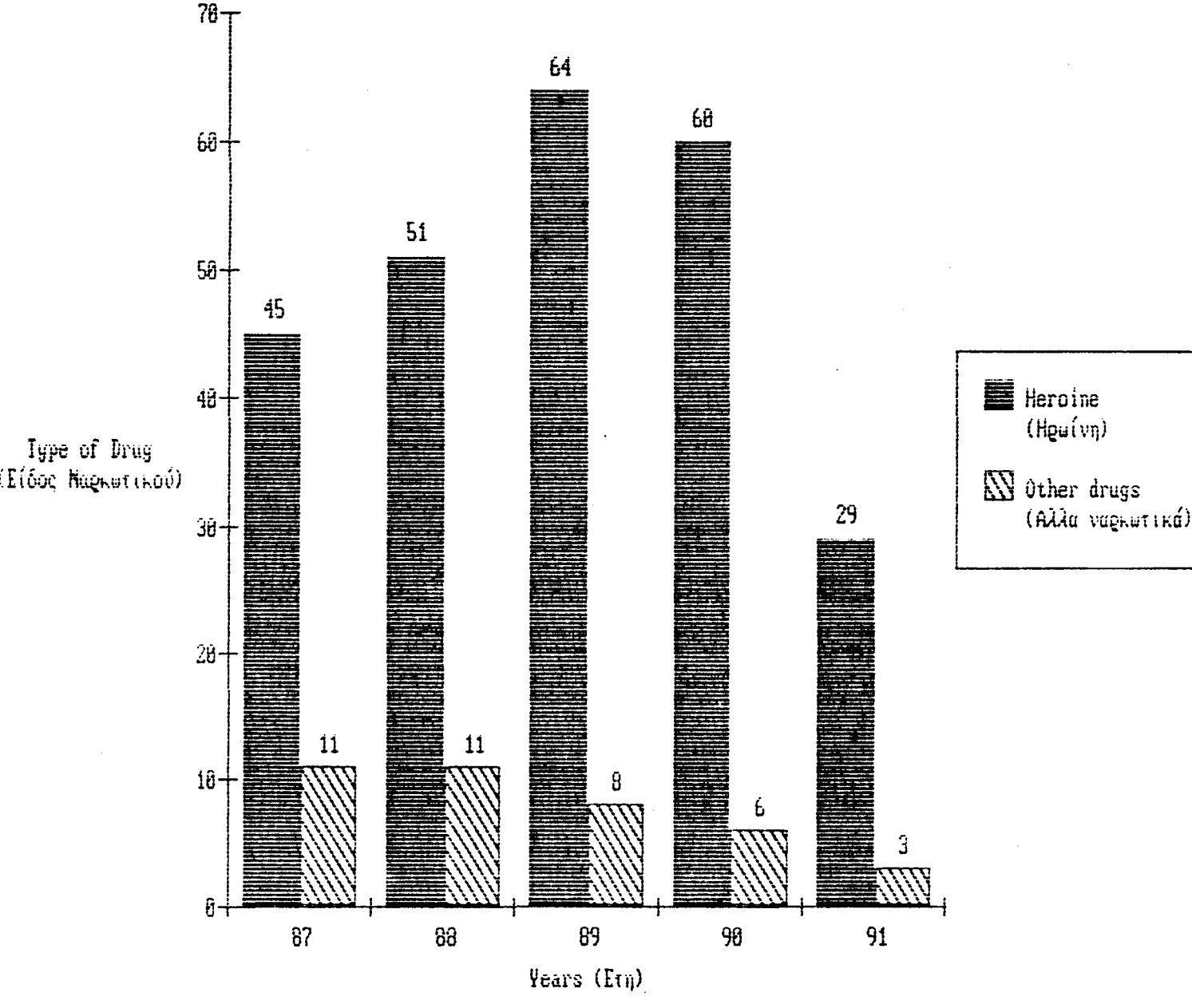


Table I : Age distribution ( Κατανομή ηλικίας)

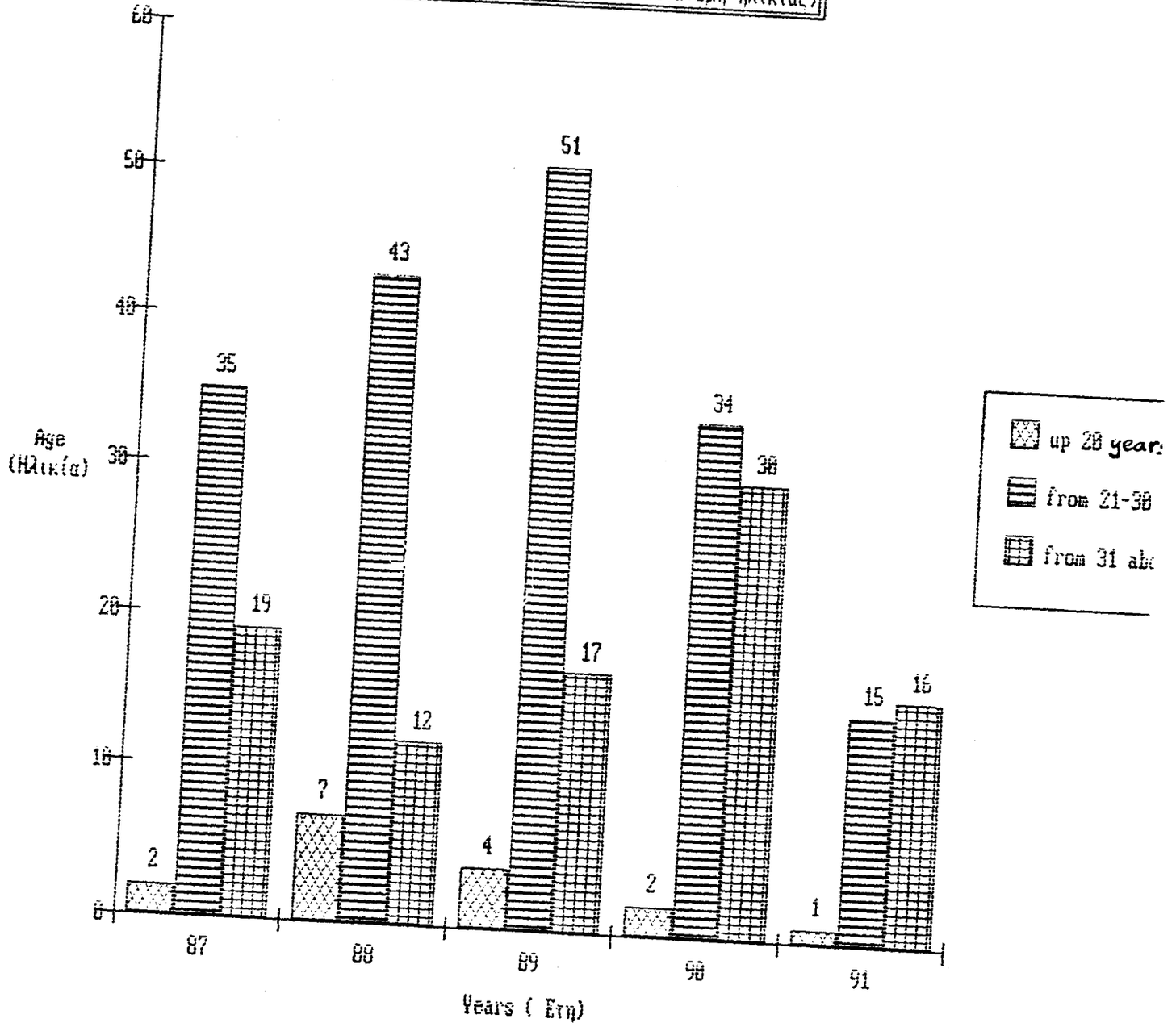


Table III : **Sex** distribution ( Κατανομή φύλου)

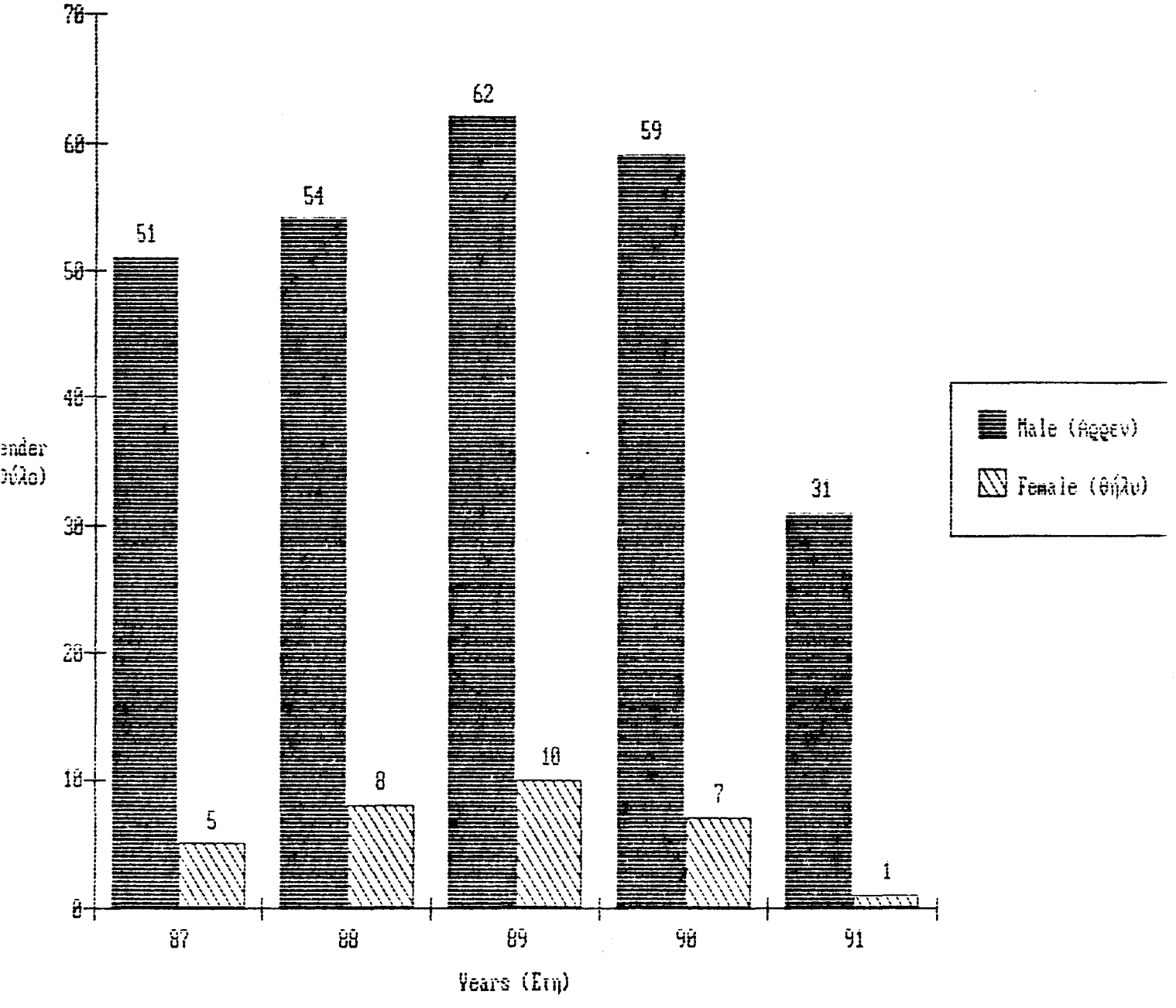
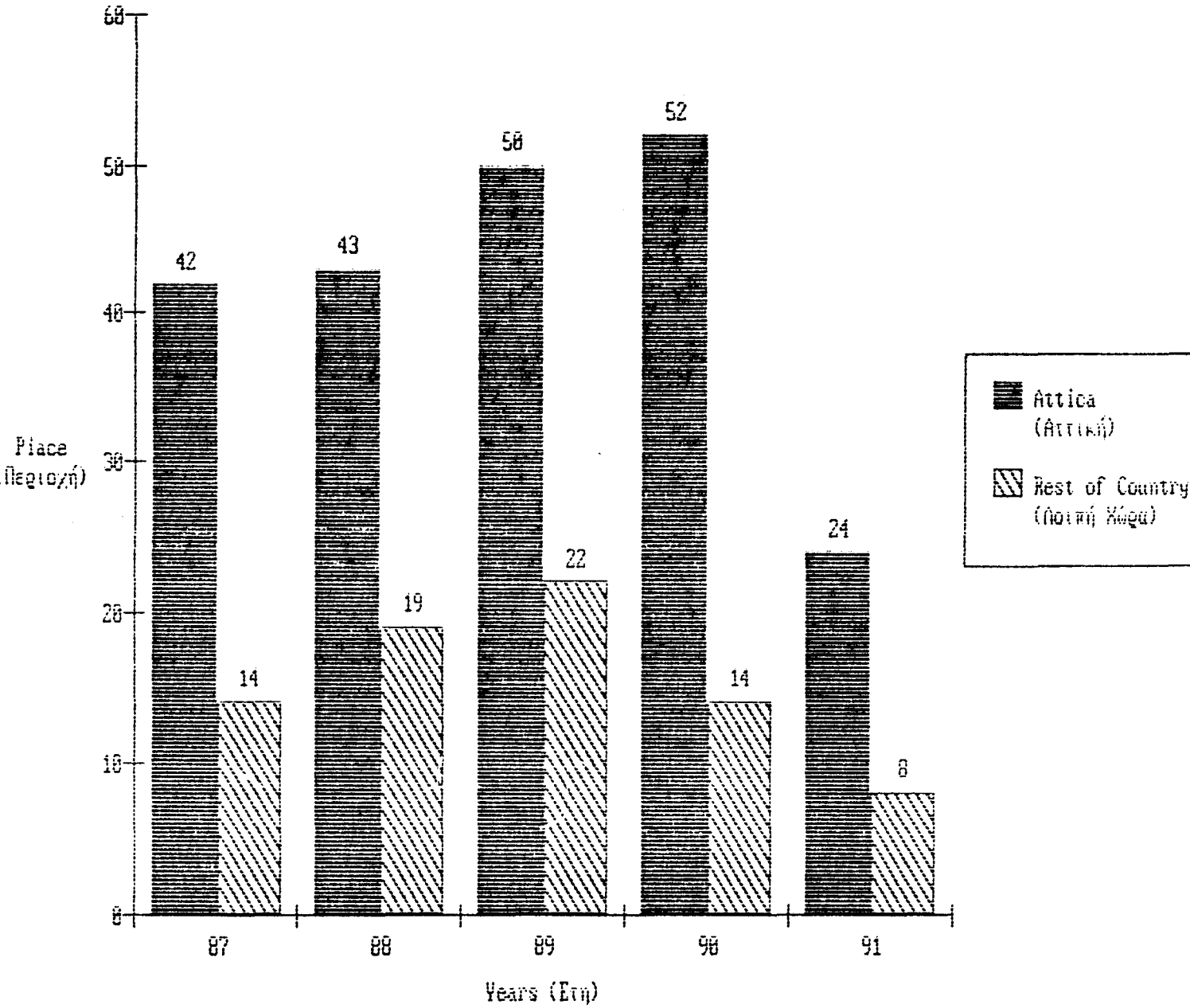


Table IV : Place distribution (Κατανομή περιοχής)



J'ai l'honneur de vous présenter une description de la situation belge en matière d'OVERDOSES .

Je n'ai pas voulu prendre position sur la manière de collecter les informations ni sur leur degré d'efficacité pratique .

Des modifications pourraient être proposées et celles-ci auraient d'autant plus de poids qu'elles pourraient être européennes.

La Belgique recueille des données statistiques concernant les overdoses par deux canaux distincts :

1° par l'OCRTIS
près du Commissariat général de la Police judiciaire
rue des Quatre Bras , 13
1000 BRUXELLES

2° par l'Institut national de Statistique
du Ministère des Affaires économiques
44 , rue de Louvain 1010 BRUXELLES

Brève description de la situation :

1° En premier lieu nous avons les données recueillies par les parquets et services de police concernant les décès sur la voie publique ou dans un lieu privé pour lesquels l'assistance de la police a été requise en raison des circonstances de la mort ou à la demande du médecin intervenant qui a considéré le décès comme "suspect".
Les services de police et de gendarmerie qui sont intervenus sur les lieux dans le cadre de toute affaire en relation avec la drogue sont tenus d'en aviser l'Office central pour la répression du trafic illicite des stupéfiants près le commissariat général de la police judiciaire . Ces informations sont corroborées et complétées par les données des parquets respectifs . Le recueil des données(y compris la nature de la substance incriminée) est identique pour toutes les régions du pays .

2° En second lieu , nous avons les données recueillies sur base des certificats de décès rédigés par tout médecin constatant un décès en Belgique y compris ceux établis par les médecins constatant un décès désignés par les parquets et décrits sous le 1° de la présente note .
En effet pour obtenir un permis d'inhumer , il est obligatoire de présenter un certificat de décès rédigé par un médecin .
Cette disposition concerne également les décès où l'intervention de la police a été requise .
Ce certificat de décès doit être remis à l'officier de l'état civil compétent .Ce document comporte une partie confidentielle où le médecin doit renseigner la cause du décès.
Cette dernière partie détachable du certificat est transmise aux inspections d'hygiène des communautés compétentes.
L'introduction et le traitement informatique des données sont réalisés par l'institut national de statistique du Ministère des Affaires économiques .
Les données introduites ressortent ensuite sous la forme préconisée par l'OMS dans la classification internationale des maladies .
Quels sont les problèmes majeurs rencontrés :
- le terme overdose doit être correctement défini:
s'agit-il d'overdoses aux substances psychotropes et aux stupéfiants tels que définis par les Conventions internationales de l'ONU (61 et 71) ou s'agit-il d'un concept beaucoup plus large?
le médecin remplissant le formulaire connaît-il ces distinctions subtiles entre ces substances et d'autres ?

il convient également de s'en référer à la note allemande 10449/90 du 29/11/90 concernant les circonstances envisagées et où le terme overdose peut couvrir plusieurs concepts :

- -les décès suite à des consommations intentionnelles ou involontaires
- -les décès suite à des abus de longue durée
- -les suicides par désespoir ou sous l'effet du sevrage
- -les accidents mortels survenus sous influence de drogues

enfin les médecins doivent être sensibilisés au problème et conscients de l'importance de la communication d' informations utilisables dans la pratique .

- la collecte d'informations précises par certificats de décès est limitée par les délais :

En effet, ce document est nécessaire pour l'obtention d'un permis d'inhumer .

Dans la plupart des cas , aucune analyse spécifique n'a pu être réalisée par un laboratoire compétent et la nature exacte de la substance ayant entraîné la mort n'est pas connue du médecin lors de la rédaction de son certificat.

Par contre , cette méthode présente l'avantage de reprendre les causes de l'ensemble des décès répertoriés en BELGIQUE .

Mon pays étudie actuellement un nouveau type de certificat de décès qui pourrait être utilisé en deux étapes et permettant au médecin chargé de la rédaction de ce document de définir exactement les causes de décès de même que la nature exacte de la substance incriminée .

- la classification internationale des maladies de l'OMS devrait être revue afin de l'adapter aux Conventions ONU en vigueur en matière de substances psychotropes et de stupéfiants .
Un classement séparé des décès par overdoses à ces substances devrait être organisé ; avant que cette démarche n'ait été accomplie il est malaisé de faire usage des données transmises.

- un autre point concerne la difficulté entraînée par les parents de la personne décédée qui souvent tentent d'influencer le médecin traitant chargé de la rédaction du certificat de décès afin que ne figurent pas sur ce document des renseignements pouvant faire croire à un décès par overdose pour préférer les mentions " décès par arrêt cardiaque ou assimilé ".
Un médecin ne sera-t-il pas tenté de signaler un décès par overdose sous un terme plus général ne permettant plus de détecter une overdose ?

- de toute façon , l'intervention d'un médecin est indispensable pour l'établissement des causes de décès et la transmission des données ne peut avoir lieu que sous le couvert du secret médical le plus strict .

- un point important de discussion concerne le dépouillement des données statistiques qui ne devrait être concevable que par des professionnels de la santé connaissant les différentes classes de substances et adoptant des tableaux clairs et connus afin de répertorier les médicaments renseignés dans leur contexte adéquat et sur base de données scientifiques .
En effet, de nombreux médicaments sont composés de mélanges qu'il n'est pas toujours facile de faire rentrer dans une catégorie bien précise .
Si plusieurs substances sont utilisées en même temps et de surcroît potentialisées par l'alcool comment préciser la catégorie exacte dans laquelle entre le décès ?

De même si plusieurs causes de décès sont identifiées laquelle devra être renseignée sur les certificats transmis ?

- enfin soulignons les délais dans lesquels les données sont disponibles : pour les données recueillies par l'OCRTIS la collecte des données est très rapide et depuis 1988 bénéficie d'une informatisation permettant de disposer d'informations plus complètes et plus précises ; pour les données en provenance des certificats de décès la collecte et le traitement de l'ensemble des données belges nécessite des délais plus importants .

Les données statistiques communiquées à titre d'exemple par l'OCRTIS sont les suivantes:

Le nombre total annuel des décès liés aux drogues et qui sont connus par les services de police s'élève à :

- 31 en 1980
- 30 en 1981
- 19 en 1982
- 29 en 1983
- 32 en 1984
- 12 en 1985
- 20 en 1986
- 17 en 1987

| overdoses | 1988 | 1989 | 1990 |
|---|---|---|---|
| Nombre total | 37 | 49 | 96 |
| Sexe : masculin | 30 | 39 | 78 |
| féminin | 7 | 10 | 18 |
| Mineurs | 6 | 5 | 13 |
| Moyenne d'âge | | | |
| - générale | 25 ans | 26 ans | 28 ans |
| - sexe masculin | 26 ans | 27 ans | 27 ans |
| - sexe féminin | 23 ans | 22 ans | 33 ans |
| Arrondissements : | | | |
| - Antwerpen | 9 | 9 | 14 |
| - Arlon | - | 1 | 2 |
| - Brugge | - | - | 1 |
| - Bruxelles | 15 | 22 | 39 |
| - Charleroi | 4 | 4 | 5 |
| - Dinant | 1 | 1 | - |
| - Gent | 1 | - | 4 |
| - Hasselt | 1 | 1 | 2 |
| - Kortrijk | 1 | 1 | - |
| - Leuven | - | - | - |
| - Liège | 5 | 5 | 17 |
| - Mons | - | 1 | - |
| - Namur | - | 1 | 4 |
| - Neuchâteau | - | 1 | 1 |
| - Nivelles | - | 1 | 1 |
| - Tongeren | - | - | 3 |
| - Tournai | - | - | 2 |
| - Verviers | - | - | 1 |
| - Veurne | - | 1 | - |

Pour 1991, on a enregistre un total de 62 overdoses au 17.10.1991

Produits utilisés :

| | 1988 | 1989 | 1990 |
|---|---|---|---|
| Héroïne | 25 | 32 | 66 |
| Cocaïne | 2 | - | 6 |
| Crack | - | - | 1 |
| Amphétamines non déterminées (N.D.) | - | 2 | - |
| Morphine | 1 | 1 | - |
| Dépresseurs N.D. | 1 | - | - |
| Neuroleptiques et antidépresseurs N.D. | - | - | 1 |
| Flunitrazepam | 2 | 1 | 1 |
| Diazepam | - | - | 3 |
| Tranquillisants N.D. + alcool (consommateur de hashich) | - | 1 | - |
| Burgodin | - | - | 1 |
| Tuinal | - | - | 1 |
| Vesparax | - | - | 1 |
| Loramet + alcool (champagne) | - | - | 1 |
| Noctamid | - | - | 1 |
| Temesta + Serenase | - | - | 1 |
| Nozinan + Dormonoct + Lerivon | - | - | 1 |
| Trichloréthylène + Loramet + Noctamid + Lévorénine | - | 1 | - |
| Procaïne + Tétracaïne + amphétamines + méthaqualone (consommateur de cocaïne) | - | 1 | - |
| Speed + cocaïne | - | 1 | - |
| Mogadon + Redomex | - | - | 1 |
| Sassi (solvant + médicaments N.D. | - | 1 | - |
| Substance non précisée dans les rapports de police | 6 | 8 | 10 |

CHIFFRES PROVISOIRES POUR 1991
Du 1.1.91 au 17.10.91

| | |
|---|---|
| Nombre total | 62 |
| Sexe masculin | 52 |
| féminin | 10 |

Arrondissements

| | |
|---|---|
| - Antwerpen | 13 |
| - Brugge | 1 |
| - Bruxelles | 18 |
| - Charleroi | 11 |
| - Dendermonde | 1 |
| - Gent | 3 |
| - Hasselt | 1 |
| - Liège | 7 |
| - Mechelen | 1 |
| - Namur | 5 |
| - Veurne | 1 |

Produit utilisé :

| | |
|---|---|
| Héroïne | 52 |
| Héroïne + Sedol (chlorhydrate de morphine | 1 |
| Méthadone | 2 |
| Flunitrazepam + Burgodin | 1 |
| Diazepam + alcool | 1 |
| Amphétamines | 1 |
| Sassi (trichloréthylène + acétate d'amyle) | 1 |
| Sassi + ether | 1 |
| Benzodiazepines N.D. | 1 |
| Héroïne + medicaments divers (acédicon , Dominal F, Tryptizol, Tranxène, ... ) | 1 |

| code OMS | cause décès | H | F | H 15/39 | F 15/39 | H >39 | F >39 |
|---|---|---|---|---|---|---|---|
| 303 | Syndrôme de dépendance alcoolique | 155 | 62 | 26 | 7 | 129 | 55 |
| 304 | Pharmacodépendance | 1 | 2 | 1 | 1 | - | 1 |
| 305 | Abus de drogues chez une personne non dépendante | 5 | 3 | - | 1 | 5 | 2 |
| E850 | Intoxication accidentelle par analgésiques, antipyré-tiques antirhumatismaux | 4 | 23 | 2 | - | 2 | 23 |
| E851 | Intoxication accidentelle par barbituriques | - | 1 | - | - | - | 1 |
| E852 | Intoxication accidentelle par autres sédatifs et hypnotiques | 3 | 4 | 1 | 1 | 2 | 3 |
| E853 | Intoxication accidentelle par tranquillisants | - | 2 | - | 2 | - | - |
| E854 | Intoxication accidentelle par d'autres psychotropes | - | 1 | - | - | - | 1 |
| E855 | Intoxication accidentelle par d'autres médicaments agissant sur les systèmes nerveux central et végétatif | - | - | - | - | - | - |
| E858 | Intoxication accidentelle par d'autres médicaments | 15 | 20 | 6 | 5 | 9 | 15 |
| E950 | Suicide par substances solides ou liquides | 184 | 188 | 87 | 64 | 97 | 124 |
| E980 | Empoisonnement par substance solide ou liquide, causé d'une manière indéterminée quant à l'intention | 12 | 10 | 7 | 4 | 5 | 6 |
| E935 à E940 | Médicaments analgésiques, anti-convulsivants, du SNC psychotropes | 1 | 7 | 1 | 2 | - | 5 |

Les données communiquées par l'Institut national de statistique sont les suivantes pour 1986 (derniere annee ayant fait l'objet de publication officielle à l'heure actuelle) .

# Drug related deaths in The Netherlands

By Giel van Brussel, Head Drug Department, Municipal Health Service Amsterdam

## Introduction

The Drug Department of the MHS provides methadone in a large programme by methadone buses and outpatient clinics to the Amsterdam drug population. This is done in co-operation with the community of Amsterdam General Physicians. The rules being that active drug users with psychiatric and somatic problems are served by the MHS, the more regulated part of the drug population obtain methadone on the basis of weekly prescribtions by the G.P.'s.

In this combined methadone programme the actual capacity is 2,000 places. In the course of a year approximately 4,000 local drug addicts use methadone. Since 1984 needle exchange is also possible. The amount of syringes exchanged is 1 million per year.

The MHS is a conglomerate of public health services and facilities. These are aimed at either collective health measures, such as vaccination, ambulance transport, youth health care, medical examination of unnatural death. On the other hand the MHS offers essential specific services for instance the control of infectious diseases as AIDS and other STD, but also the basic medical care for active drug users. As a public health service another feature is the support given to police, hospitals and private doctors in the actual daily management of the drug users. This implies that the MHS always puts emphasis on a thorough systematic registration, that provides the opportunity for epidemiological research.

## The development of the Amsterdam drug problem

As a result of the positioning of the drug department and a central medical registration by name and birth date of all drug contacts in the methadone programmes, hospitals and police stations we have a fairly reliable picture of the total drug population. The trend in this opiate-addict population is clear in the sense that there is a stabilization of the total population in combination with an increasing average age.

Dia 1 - The Amsterdam drug population by capture/recapture
Dia 2 - Average age development

As a result of this stabilization the average addiction career is lengthening and is now 10 to 15 years. As a result of this development the pathology within the drug population changes. In the beginning, say 10 years ago, the factor most appealing to the public image of drug users was the large number of acute direct drug related deaths, namely lethal overdoses. Another major factor in the late seventies and early eighties was the number of drug addicts dying by accidents, drowning, etc. Death by infectious diseases, hepatitis but also endocarditis, was fairly rare.

Recently the number of overdose deaths is regressing slightly, also the prevalence of violent death seems lower, but sharply rising is the prevalence of death among AIDS/drug patients. In these patients death often is not caused by definitive AIDS, but by intercurrent, bacterial infections such as endocarditis, but also by "lethal overdosage" or by accidents. In these cases death is often due to more factors that are interrelated.

Dia 3 - The number of AIDS cases - various origins/causes
Dia 4 - Mortality by overdosage

Mortality research procedures

In The Netherlands the procedures concerning the correct processing of the dead body are stipulated in the "Wet op de Lijkbezorging". In this law emphasis is put on the detection of crime-caused death. This is done by distinguishing between natural and unnatural causes. Natural death is caused by spontaneous disease or old age. Unnatural is if caused by external factors such as accidents, murder, suicide, poisoning, overdosage. There is a "grey" area in the sense of indirect unnatural causes, such as i.v.-drug use. In these cases where there is a long time span between the causative external factor - the injection - and the actual time of death, such as AIDS, the death is deemed to be caused by "natural causes".

If death is diagnosed as caused by natural causes, the physician, responsible for the treatment, e.g. the general physician or hospital doctor, gives out a declaration of "natural death" to the family that arranges burial procedures. Also a closed anonymous declaration is made up by this "treating doctor" with medical data concerning the principal and contributing causes of death. This anonymous declaration is processed by the "Centraal Bureau voor de Statistiek", that makes up death statistics. As a consequence of this procedure - almost all the doctors in Holland fill in these declarations - there is a limited reliability especially in fairly rare causes of death.

If death is caused by "unnatural causes" a certificate stating an unnatural death is made up and the Dutch equivalent of the Coroner is notified by the City Police. This Dutch coroner is placed in office by the mayor. He/she is a doctor employed by the MHS. The deceased is examined "in situ" in the place where he/she is found dead. This examination is external and is focussed on the question "is foul play possible". The coroner makes up a statement for the public prosecutor in which the case and its circumstances are described in detail. On the basis of the report by the coroner and the police, the public prosecutor comes to the conclusion that he/she is satisfied there is no evidence of crime and a permission for burial of the body by the family is given out. Or there is suspicion on the cause of death and the possibility of crime. in that case an obduction with toxicologic analysis takes place and is executed most often by the "Rijks Gerechtelijk Laboratorium".

An in depth research concerning the cases of acute death after drug abuse in Amsterdam between 1984-1986 has been done by Cobelens and Sluijs to ascertain the number of cases, the exact way of dying, the procedures followed, etc.
The results were as follows.

- The number of cases of acute drug death in these 3 years was 175.
- In about 1/3 (57) cases obduction was performed, including toxicologic.

- The average duration between the fatal injection of drugs and the time of death varied greatly in the 67 cases in which testimonies of witnesses were available.
  In 42% the timespan was shorter than 3 hours.
  In 52% the timespan was between 3 and 24 hours.
  In 6% of the cases the delay was more than 24 hours.
  So much for the acuteness of acute death.

- In the 57 obducted cases of drug deaths one turned out to be caused by a subdural haematoma, and one by carbon monoxide poisoning.
- In all but 13 cases morfine was found, often in combination with alcohol, cocaine, pills, methadone.
- In the remaining 13 cases:
  * in 3 only alcohol was found, and no other psychotropic substance.
  * in 4 methadone in combination with other non-opiates.
  * in 3 cases just cocaine was found or in combination with alcohol.
  * in 3 cases there were combinations of amfetamine/alcohol, benzodiazepines/alcohol and benzodiazepines/tolueen.

These data give a perspective on the heterogenity of the toxicologic causes of death in "overdosage deaths".

<u>Consequences of the above for the insight in drug related mortality</u>

* The reliability of rare causes of death such as drug overdosage, etc. produced by aggregation of nationwide data is of necessity very limited and also late in coming.

* The emphasis on the judicial aspect of the research of drug deaths prohibits insight. Drug use in itself is <u>not</u> seen as a crime, neither is death by overdosage.
  As a consequence routine toxicological data of drug users, who have died because of overdosage, are not available.

* The procedures concerning the functioning of the "Dutch coroner system" make it obvious that there is a very real possibility of falsely diagnosing acute drug death of people in the age group 20-40 years as due to drug overdosage. A sudden heart failure by heartinfarct, lung embolus, etc. could be easily overlooked in a relatively young person, especially if there are signs of drug use.

## Conclusion

The only way of improving our knowledge concerning drug related death is standardising national procedures concerning the management of death registry and validating the results of these procedures by intense directed local research schemes aimed at specific mortality categories.
It is probably wishful thinking that in the absence of national standardization it would be possible to standardise definitions and procedures internationally. It seems easier to accept these differences and try to define the qualitative and resulting quantitative consequences of the differences in definition and existing research procedures. A way to do this would be a monitoring project on several European locations that are characterised by:

- a large drug epidemic of which the consisting individuals are known.
- a precise defined procedure of finding and examining causes of drug death.
- the study should be aimed at detecting all the causes of death in drug users.

# Drug Related Deaths "Questionnaire"

Josep Roca-Antònio

Barcelona October 1991

## I. Definition actually used in each country

### a) Definition

Mortality due to acute reaction to drug use (overdose, anaphylactic shock, etc).

### b) Sources of available data

In Barcelona the source is the Anatomic Forensic Institute of Barcelona. In Spain there are Anatomic Forensic Institutes in 16 large urban centers and they are the source for the State Information System on Drug Addiction (SEIT). For the other cites we have not source of information.

### c) Is there a distinction between different causes of drug related deaths (D.R.D.)?

For the acute death, usually there is not distinction.

### d) Are there regional differences in terms of definitions?

In theory, there are not differences. In fact, perhaps are differences between Forensic Doctors.

### e) Is the ICD in use?

In the Forensic Institutes not. But in the general mortality statistics at national level, yes.

## II. Available data

See tables II, III and IV.

The deaths are not automatically screened for drugs. Only if the Forensic Doctor suspect a drug related death.

## III. Description of data collection

See next paragraph.

## IV. Description of past and present DRD research/studies in your country.

**Tabla I.** Population de la ville par âge et par sexe en 1988. Barcelone 1988 / Population figures for the town by age and sex. Barcelona 1988.

Superficie / area: 9.907,41 $Hm^2$.
Croissance de la population: diminution (-22.422).
Population growth: decrease (-22.422).

A: En chiffres absolus / Absolute nombers(*).

| groupe d'âge/ age group | h/m | f | TOTAL |
|---|---|---|---|
| -15 | 140652 | 132561 | 273213 |
| 15-19 | 67182 | 63750 | 130932 |
| 20-29 | 137937 | 133526 | 271463 |
| 30-39 | 111676 | 116494 | 228170 |
| 40-49 | 103668 | 110672 | 214340 |
| +50 | 261436 | 354947 | 616383 |
| Total | 882551 | 911950 | 1734501 |

B: En Pourcentages / percentages

| Groupe d'âge/ age group | h/m | m | Total |
|---|---|---|---|
| -15 | 8.11 | 7.64 | 15.75 |
| 15-19 | 3.87 | 3.68 | 7.55 |
| 20-29 | 7.95 | 7.77 | 15.72 |
| 30-39 | 6.44 | 6.72 | 13.16 |
| 40-49 | 5.97 | 6.32 | 12.29 |
| +50 | 15.08 | 20.45 | 35.53 |
| Total | 47.42 | 52.58 | 100.00 |

h/m = hommes / male.
f = Femmes / female.

Source:Anuari Estadístic de la Ciutat de Barcelona.
1989 Ajuntament de Barcelona.

**Tabla II.** Evolución anual de la edad de fallecimiento y sexo de los casos en que estas variables fueron identificadas. Barcelona, población 15-39 años, 1-8-1984 a 31-7-1985. N(%).

| | AÑO | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1978-83 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
| **SEXO** | | | | | | | |
| **Hombres** | 28(80) | 27(82) | 36(80) | 29(83) | 33(65) | 76(78) | 134(80) |
| **Mujeres** | 7(20) | 6(18) | 9(20) | 6(17) | 18(35) | 22(22) | 33(20) |
| Total | 35(100) | 33(100) | 45(100) | 35(100) | 51(100) | 98(100) | 167(100) |
| **EDAD** | | | | | | | |
| 15-19 | 3 (9) | 1 (3) | 5(11) | 2 (6) | 5(10) | 2 (2) | 9 (6) |
| 20-24 | 8(25) | 14(44) | 13(29) | 14(41) | 14(29) | 26(27) | 42(27) |
| 25-29 | 8(25) | 9(28) | 19(42) | 12(35) | 17(36) | 46(47) | 63(40) |
| 30-34 | 6(19) | 5(16) | 4 (9) | 4(12) | 6(13) | 18(18) | 27(17) |
| 35-39 | 5(16) | 2 (6) | 3 (7) | 2 (6) | 5(10) | 3 (3) | 13 (8) |
| >39 | 2 (6) | 1 (3) | 1 (2) | - | 1 (2) | 3 (3) | 3 (2) |
| Total | 32(100) | 32(100) | 45(100) | 34(100) | 48(100) | 98(100) | 157(100) |
| Media | 28.0 | 26.3 | 26.0 | 25.4 | 26.5 | 27.2 | 27.2 |
| DE | 7.5 | 5.5 | 5.4 | 4.8 | 6.1 | 6.1 | 5.4 |

Se han agrupado los años 1978-83 por el pequeño número de casos.
En 18 casos se desconoce la edad.

**Tabla III.** Distribución anual del porcentaje de muertes entre 15 y 39 años sobre el número total de fallecidos. Residentes Barcelona 1983-88.

| | Años | | | | | |
|---|---|---|---|---|---|---|
| | 1983 | 1984 | 1985 | 1986 | 1987 | 1988 |
| MORTALIDAD | | | | | | |
| Total | 15865 | 15233 | 16039 | 16024 | 15523 | 16849 |
| Juvenil | 450 | 424 | 459 | 520 | 533 | 728 |
| % de muertes juveniles | 2.82 | 2.78 | 2.86 | 3.24 | 3.43 | 4.32 |

1. **National Plan on Drugs Office. Trends in Mortality due to acute reaction to drug use in Barcelona, Bilbao, Madrid, Sevilla, Valencia and Zaragoza: 1983-1989.** A national level study. The sources of data used are autopsy reports by forensic doctors. In previous studies these have proven to be the most reliable and valid sources[1]. In the large urban centers, this information is held at the Anatomic Forensic Institute. The data from these studies have been obtained from the Forensic Anatomic Institutes (IAF) in Barcelona, Bilbao, Madrid, Sevilla, Valencia and Zaragoza. The study included all deaths due to acute reaction after use. The

**Tabla IV.** Distribución anual de los fallecidos por reacción aguda a drogas. Barcelona 1978-89.

| | Año de ingreso IAF | | | | | | |
|---|---|---|---|---|---|---|---|
| | 1978-83 | 1984 | 1985 | 1986 | 1987 | 1988 | 1989 |
| SEXO | | | | | | | |
| Hombre | 28 | 27 | 36 | 29 | 33 | 76 | 134 |
| Mujer | 7 | 6 | 9 | 6 | 18 | 22 | 33 |
| Total | 35 | 33 | 45 | 35 | 51 | 98 | 167 |

Se han agrupado los años 1978-83 dado el pequeño número de casos.

study excluded all cases in which the cause of death was a traffic or work accident, homicide involving the use of firearms, etc. The main results are:

1553 deaths were caused by acute reaction to drug consumption, primarily heroin and cocaine, during the study period. Their distribution was: Barcelona 448, Bilbao 71, Madrid 775, Sevilla 56, Valencia 147, Zaragoza 56.

There is a clear rising trend in drug-caused mortality, both overall and in each city. 82 deaths were registered in 1983, while 455 were registered during 1988.

The average age of victims was 26.2, with an increase in age during the study period. 69% of the cases were in the 20-29 year old age group.

The sex ratio is 4:1 in favor of males.

The drugs found most frequently in blood samples were morphine and metabolites.

The most frequent combinations of drugs in both blood and urine samples were morphine and benzodiacepines.

There has been an increase in the numbers of persons with traces of cocaine, often associated with morphine, in blood and urine samples.

2. **Josep Roca-Antònio. Epidemiology of the mortality due to adverse reaction to drugs, in the City of Barcelona 1978-1989.**
**Object:** (a) To study the evolution of the mortality due to acute reaction to drugs, in Barcelona, between 1978 and 1989, in order to be able to assess the evolution of the epidemic of drug abuse, basically opiates, within the city of Barcelona. (b) To determinate the characteristics of the addict casualties. (c) To assess the impact of addiction on the mortality of the population between the ages of 15 and 39 years, and its evolution.

**Design:** The study makes an analysis of the temporal distribution of the cases over the period 1978-89 in order to identify the secular trends of the mortality frequency.

**Population:** The population from which the sample for study was extracted was that of the autopsies carried out in the Forensic Anatomy Institute in Barcelona, and they correspond to deaths which occurred within the municipality of Barcelona where a Forensic Doctor had intervened, during the period under study. In order to determine which would be the most appropriate source of information, a previous study had been carried out at the Forensic Anatomy Institute (IAF) and at the National Toxicology Institute (INT), at hospitals, and by means of the Death Statistics Bulletin. All deaths occurring from these sources, do to any cause and between the ages of 15 and 39 years, were investigated in order to identify the cases of death do to drugs. This preliminary study allowed us to conclude that the most appropriate sources for studying the deaths do to acute reactions were those of the IAF and INT, to be used jointly.

**Results:** The total number of persons deceased do to acute reaction over the twelve years under study was of 464. Their average age was 27 years, and this did not vary significantly over the entire period. Most of the deaths occurred between 25 and 29 years of age, and 78% of them were men. Most of the people had lived in Catalonia and in the city of Barcelona or its metropolitan area, and they had been born in Catalonia. The "Ciutat Vella" district had a mortality rate five times higher than the average for Barcelona as a whole. The potential loss of years of life (ADVP) due to drugs was on the increase continuously throughout the period under study, with this representing the second cause of ADVP, following traffic accidents, in 1988. In Barcelona, and during the period under study, deaths due to acute reaction underwent a non-linear increase of a hyperbole type. The most accentuated mortality were produced in the years 1983, 1988 and 1989.

**Discussion:** The distribution and evolution of the age of the addicts and their comparison with other studies on mortality suggest that the drug addict population in Barcelona is still relatively young, and there is no predominant ageing. The fact that most of them lived in Barcelona suggests that there has been no important migration of drug addicts from the metropolitan area towards the city of Barcelona in order to consume drugs, as opposed to what is happening in other cities such as Amsterdam. The only localized grouping of deaths was produced within the "Ciutat Vella", the most depressed area within the city. In this case, the phenomenon is but an additional expression of the economic, social and cultural problems being suffered in this district rather than its representing an isolated problem that could be tackled independently. The impact of addiction in the ADVP is underestimated due to only taking deaths due to acute

reaction into account. Deaths due to complications can be on the increase, since the number of addicts having died of AIDS is on the increase in barcelona over recent years, and its impact on the mortality of the addicts should be taken into account. The general trend of the mortality between 1978 and 1989 would be the reflection of an increase in the total volume of addicts in Barcelona, and indicates that the problem started to become widespread in the eighties. This study has allowed us to get to know the mortality indicator do to acute reaction in barcelona over recent years, increasing our understanding of the epidemic do to drug abuse being suffered in Barcelona. The relevance has been mentioned of the IAF-INT bionomy as a source of health information in general and on drugs in particular. The fact of their being used jointly in assessing the mortality due to acute reaction has improved the statistics which being registered up until now.

## V. Analysis of problems raised by available data.

### a) Coverage

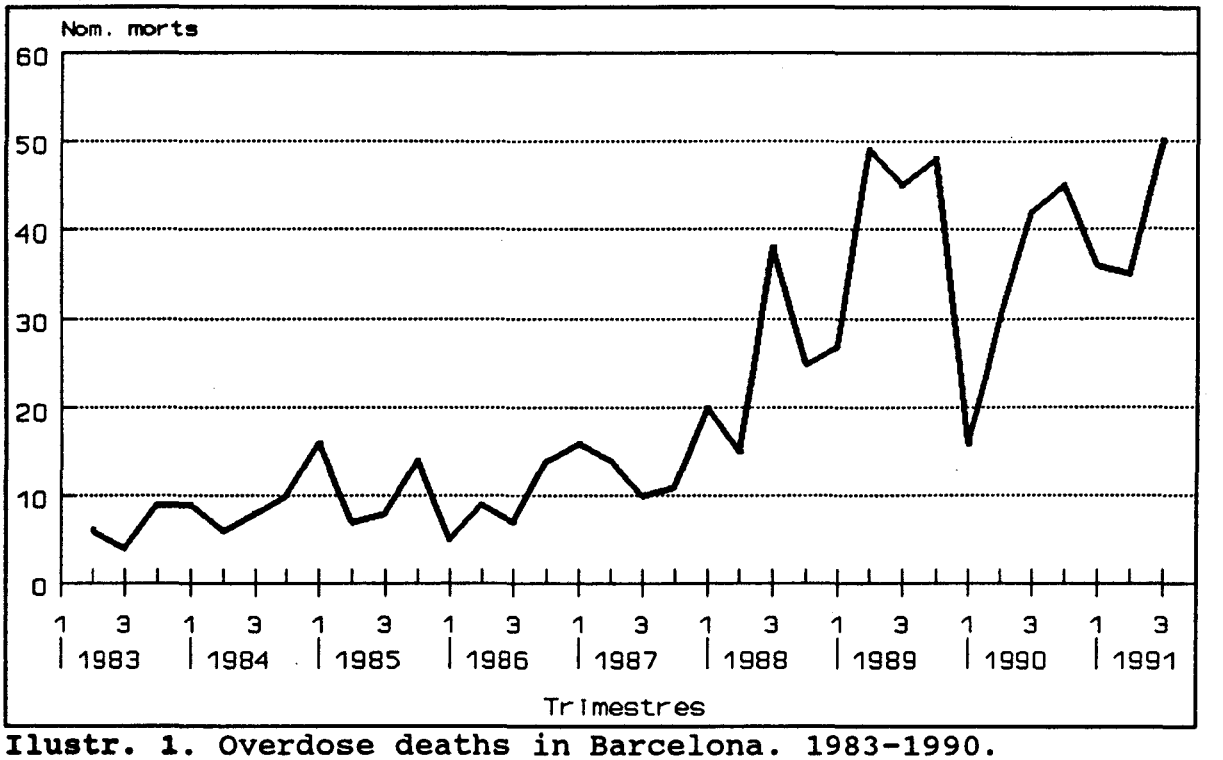
We can have data for the city with Forensic Anatomic Institute (16 cities). We have not reliable data at national level.

### b) Reliability

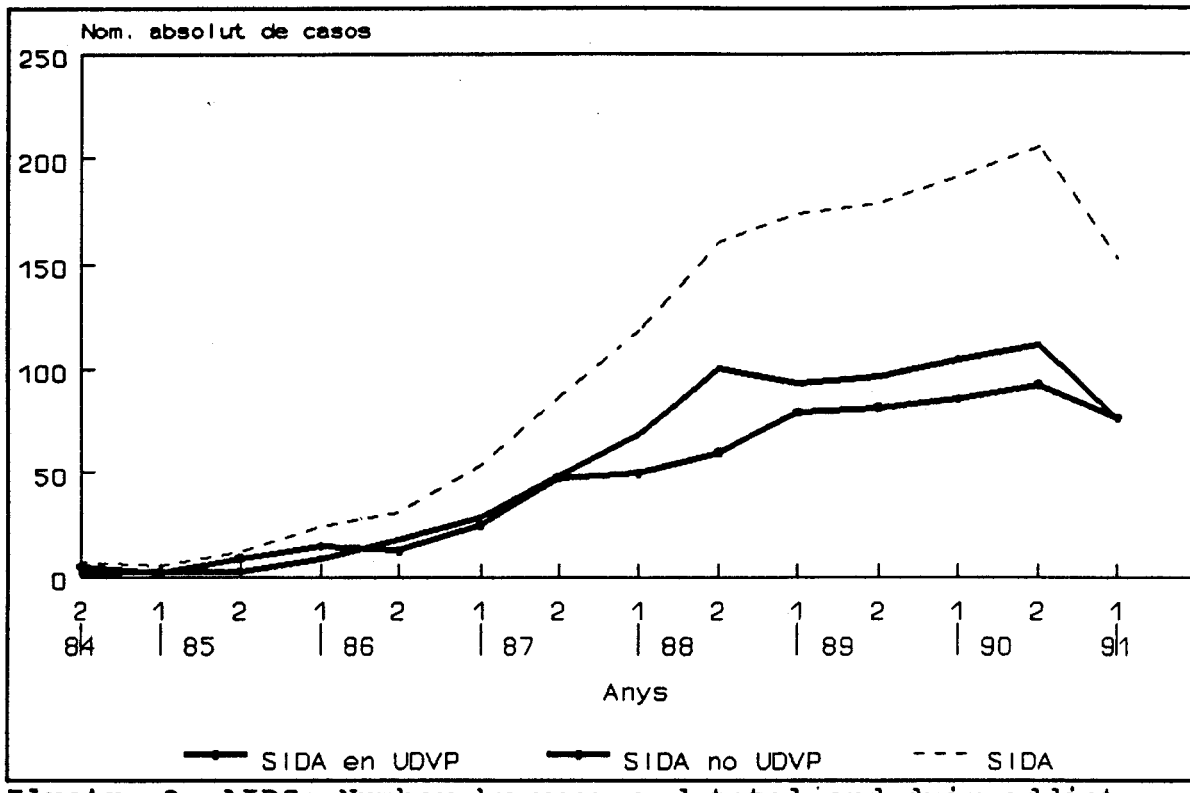
The data are reliable for the deaths caused by acute reaction to drug consumption. The comparative analysis of data used to study mortality caused by acute reaction to drug consumption has show that the IAF are more valid and reliable sources than those used previously such as police records which, while useful in the study of trends, tend to underestimate the magnitude of the phenomenon.

## VI. Conclusion.

The main problem is the limited coverage at national level. We have not an easy way to improve this coverage. At national level there are mortality statistics, but this data are not reliable for drug related deaths.




**Ilustr. 1.** Overdose deaths in Barcelona. 1983-1990.




**Ilustr. 2. AIDS: Number by year and total and drig addicts.**

**Bibliografia**

1. Josep Roca-Antònio. Epidemiología de la mortalidad por reacción aguda adversa a drogas en la ciudad de Barcelona, 1978-1989. Tesis doctoral. Universidad Autónoma de Barcelona, Facultad de Medicina, Departamento de Farmacología y Psiquiatría. Barcelona 1990.

# Drug Related Deaths in New York City: Epidemiologic Insights and Procedures

Blanche Frank, Ph.D.

Chief of Epidemiology, New York State Division of Substance Abuse Services

Since 1951, at least 18,000 people in New York City have been certified as dying directly as a result of drug-related causes. This number represents a very large loss of life and an indication of the severity of the drug abuse problem in my City. Many medical examiners, epidemiologists and public health professionals have carefully studied this long-term phenomenon in the hope of preventing future deaths. Today, I would like to share with you some of these findings and our procedures. Hopefully, others can learn from our grim experience.

## Epidemiologic Insights

### Historical View (Helpern & Rho, 1967)

Heroin has long been the specific drug that is most frequently involved in drug-related deaths in New York City. The mode of heroin use underwent a significant change between the end of World War I and the beginning of World War II. Instead of the subcutaneous injection of solution or the inhalation and sniffing of the substance, the intravenous injection of heroin diluted with other substances became the most frequent mode of administration. This practice of using heroin intravenously by needle is thought to have started in Cairo, Egypt, by addicted seamen and imitated by addicts in maritime cities around the world. This mode became the method of choice in most places where drugs were being used. Nevertheless, prior to 1943, there were very few deaths in New York City among addicts caused by overdosage. There were occasional deaths due to sepsis, bacterial endocarditis, septic

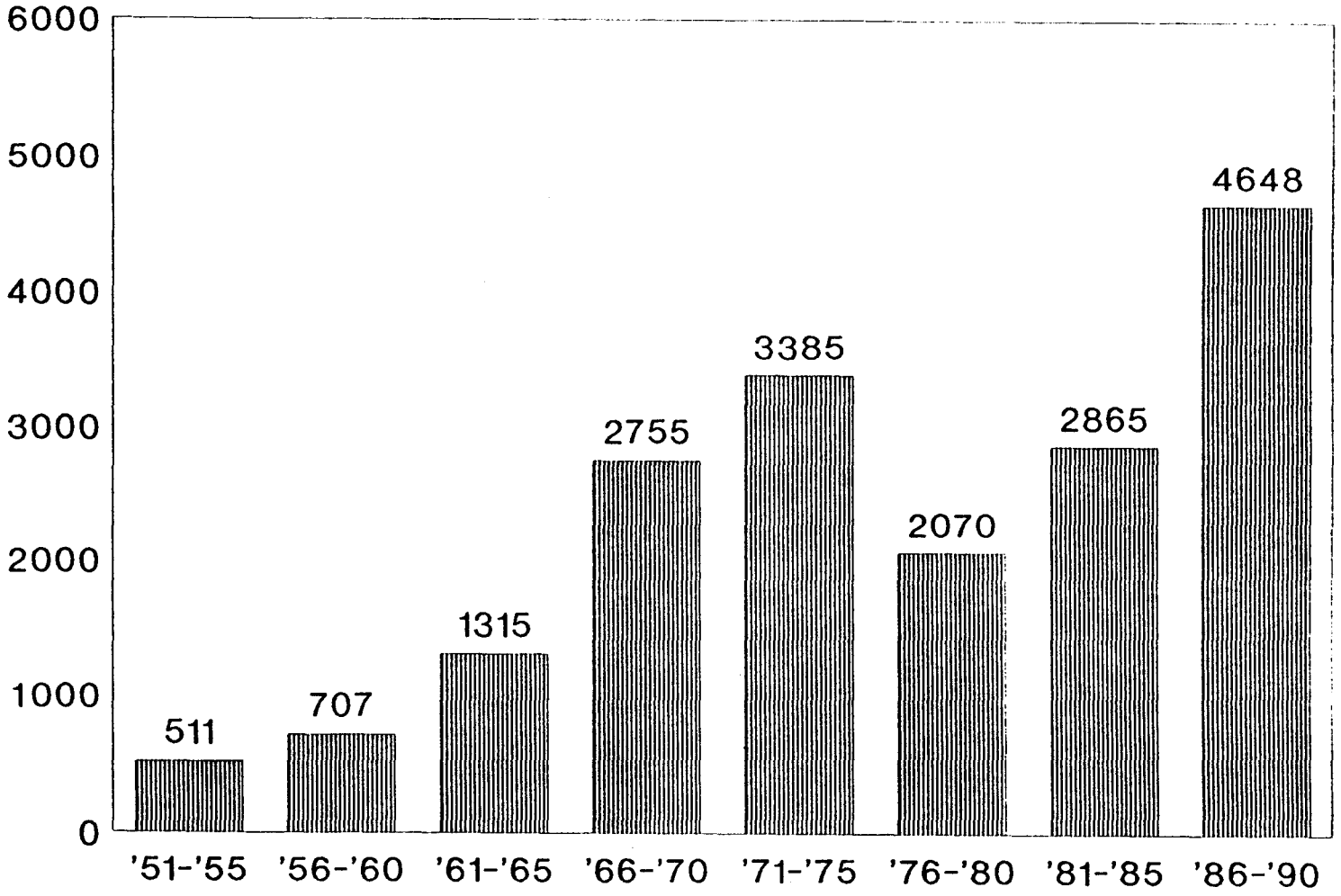
thrombophlebitis, tetanus, and viral hepatitis. Malaria had been a frequent cause of death in the 1930s among addicts who had become infected directly through the common use of unsterilized syringes. As a consequence, addicts and traffickers started to use quinine as a diluent in heroin mixtures. Interestingly, the use of quinine has been so effective and widespread that there have been almost no cases of artificially transmitted malaria among intravenous drug users since 1943.

After the end of World War II in 1945, illegal traffic in heroin resumed and the drug began to be smuggled into the United States in increasing quantities. Large urban centers like New York City became markets for heroin distribution. An important indicator of the impact was the increasing number of fatalities or deaths due to the chronic and/or acute effects of drug use, principally the intravenous use of heroin. The trend in the number of these deaths over time generally reflects the rise and fall of heroin availability on the streets of the City.

The bar chart on the next page shows the magnitude and trend in deaths due to drug use from 1951 through 1990 for five-year periods. Over this time, the rate of these deaths in New York City has increased from about 1 per 100,000 population to 14 per 100,000 population. The almost 5,000 deaths indicated in the period only from 1986 to 1990 show the impact of deaths involving cocaine as well as heroin.

In comparing the demographic characteristics of the decedents over time, some elements have remained amazingly similar. For instance, gender breakdown appears to be fairly constant: in the 1950's, 78 percent were males and 22 percent were female; by the late 1980's, the very same distribution maintained. Second, blacks and Hispanics continue to represent the majority of decedents. Also, the health districts in the City where decedents had

# DEATHS DUE TO DRUG ABUSE
## NEW YORK CITY, 1951-1990




Source: NYC Dept. of Health

resided shows that one particular area remains by far the area where an extraordinarily high rate of deaths due to drug abuse occurs. That health district remains Central Harlem. In 1969 for instance, the rate of drug-caused deaths per 100,000 population was 49; 20 years later in 1989 that rate was 52 per 100,000 population.

Other demographic characteristics, however, have changed substantially. Most importantly, young people do not represent the large proportion of decedents as they did in the past. In the 1950s, about 35 percent of these decedents were less than 25 years of age; in the late 1980s, only 7 percent were less than 25 years of age. In fact, an older population of people are dying as a result of drug abuse. In the 1950s, only 26 percent were 35 years and older; in 1989, 56 percent of the decedents were 35 years and older. Another interesting finding also concerns the geographic distribution of residence throughout the City. Despite the fact that one health district in Manhattan consistently shows the highest rates of deaths for its residents due to drugs, the borough of Manhattan was in the 1950s by far the most likely borough of residence for these drug abusers, home to 72 percent of them. By the end of the 1980s, Manhattan was the borough of residence for 35 percent, followed by 30 percent who resided in Brooklyn, and 21 percent who resided in the Bronx. Over the years, apparently, the problem has penetrated many more areas throughout the City.

Another interesting and encouraging development in the last year or so appears to be a dramatic downturn in the number of deaths due to drugs. In 1988, there were 1,210 such deaths; in 1989, 1,020; and in 1990, about 700. This decline may reflect several changes in drug-using behavior. First, there are indications that cocaine use--especially the use of crack--may be slowing down. Indicators of cocaine abuse, such as, hospital emergencies and treatment admissions are declining. Second, there are also indications that

users of heroin are turning away from intravenous use and are trying once again the inhalation or the intranasal use of heroin. This change in mode of use probably stems from the fact that the heroin currently available on the streets of New York City is high in purity, averaging more than 30 percent pure. Also, the threat of AIDS has been a deterrent to using the needle. In any case, this is a welcomed respite after a trend that has been increasing at a very rapid rate.

Prevalence and Incidence

In our own work in my agency, we have been following these drug-related deaths or deaths due to narcotism for many years along with other indicators of drug use, especially the use of heroin and other narcotics. One purpose was to develop a strategy for estimating the size of the narcotic-using population. Since my agency is responsible for providing treatment services and programs for drug abusers in New York State, knowing the total population that may be in need of these services is fundamental to planning and allocating resources.

Interestingly, one Medical Examiner in New York City, Dr. Michael Baden, estimated the number of heroin addicts in New York City in the late 1960s and early 1970s based on heroin-related deaths. At that time, New York City maintained a Narcotics Registry. Dr. Baden calculated that the overdose death records in New York City constituted approximately one percent of the known heroin addicts on the New York City narcotics registry. That "one percent" rule became a quick measure of heroin prevalence based on death data alone (Baden, 1970). Today, we have no way of knowing whether the relationship holds true.

A more elaborate strategy for calculating heroin prevalence that we devised involved the use of drug-related deaths along with other indicators of opiate activity such as opiate-involved arrests, cases of hepatitis, and the price and purity of heroin on the streets of New York City. Several agencies in the City were responsible for routinely collecting these data. Also, as already mentioned, the New York City Department of Health maintained a Narcotics Register. This Register was established in 1963 and issued its last report on 1974 data. Over 500 law enforcement, treatment and health-related agencies cooperated in the reporting effort. By 1974, the Register had received reports on 300,000 individuals in New York City. What we attempted to do was relate the trend in the several indicators--including drug-related deaths--to the magnitude shown by the Register over time. On the one hand, we factor analyzed the indicators--drug-related mortality, opiate-involved arrests, cases of hepatitis, price and purity of heroin--and found a very strong "street" factor; these indicators correlated very strongly with each other. On the other hand, we modified the numbers reported by the Register, making important corrections. We reduced the number by a factor for inactivation and a factor for "false positives;" but we also increased the estimates by a capture-recapture methodology. The indicator factor scores were related to these Register prevalence estimates in regression analysis for 1970 through 1974, yielding a regression equation. After 1974 when Register data was no longer available, but indicator data were, this regression equation was able to yield prevalence estimates. However, many years have passed since the Register ceased operation. Some of the indicator data are also no longer available. Although we are currently attempting to develop other methodologies, the effort I just described was an interesting adventure in the

use of drug-related death data along with other drug abuse indicators. I have with me an article we published, describing the procedures, entitled, "Seeking Truth in Heroin Indicators: The Case of New York City."

Another way death data were used which proved very insightful regarding the course of the AIDS epidemic involved the monitoring of all causes of death among the addict population in New York City. One of the earliest signs that something untoward was happening in the addict population was an increasing number of deaths due to pneumonia, endocarditis and tuberculosis. Using an indirect indicator approach and the surveillance efforts of the New York City Department of Health, a study was conducted to determine whether a proportion of these deaths were, in fact, HIV-related, and whether the overall numbers of AIDS cases among intravenous drug users were undercounted in New York City. Staff members of the New York City Department of Health, and of the New York State Division of Substance Abuse Services (Stoneburner et al., 1988) reviewed death certificates and the AIDS surveillance registry, conducted a special medical record review of deaths among narcotics users in 1985, examined lung tissue from narcotic users who died of pneumonia, and, finally, studied the mortality in a cohort of IV drug users. The review of 7,884 deaths from 1978 through 1986 was particularly significant. In 1978, there were 263 deaths among IV drug users; during the years from 1979 through 1981, there were an average of 488 deaths per year; during the years from 1982 through 1986, the number of deaths rose from 492 to 1,996. The interesting fact is that the number of deaths that were drug-related remained essentially unchanged over this time period while the number of deaths among IV drug users attributed to pneumonia, endocarditis and tuberculosis increased. The review of medical records, the examination of lung tissue retrieved from the Office of the Chief Medical Examiner for narcotic users, and a study of deaths among a cohort of

drug users from 1984 through 1986 all indicated an increase in mortality that may not have met the surveillance definition of AIDS but were very likely to be related to HIV infection. Looking then at just the 6,157 deaths reported among IV drug users from 1982 to 1986, subtracting the deaths that were probably due to drug-related causes alone, an excess of 2,520 deaths occurred among these drug users in New York City during those five years. The significance of this suggestive analysis raised doubts about the accuracy of the counts of deaths due to AIDS, and consequently doubts about the number of AIDS cases reported in New York City. A closer look at the demographics of these "excess" cases also showed a very high proportion of blacks and Hispanics. Thus, the impact of AIDS on these minority groups was also probably understated.

Procedures

Now I would like to share with you the procedures set up in New York City by which causes of death are determined and reported, especially concerning drug-related deaths.

In New York City, the Chief Medical Examiner is the individual responsible for investigating violent, suspicious or unexpected deaths and deaths that are unattended by a physician. All deaths that are caused or contributed by drug and/or chemical overdose or poisoning come under this definition. The Chief Medical Examiner is a licensed physician with training and extensive experience in pathology, and is appointed to the position. He works with a team of pathologists, and has a great deal of autonomy in determining many of the procedures for investigating and evaluating the almost 40,000 deaths each year that fall within his jurisdiction.

The crucial determination for the Chief Medical Examiner is the underlying or proximate cause of death rather than the immediate cause of death. The mechanisms of death, such as congestive heart failure or sepsis, may be quite different than the underlying cause of death. These mechanisms of death lack etiologic specificity, and are unacceptable as substitutes for underlying causes of death.

With regard to drug-related deaths, the current Chief Medical Examiner, Dr. Charles Hirsch, has broken with the past somewhat. He has been much more concerned with specificity. For instance, the cause of death on the death certificate now indicates the substance or substances responsible for the fatal intoxication. In the past, the drugs involved were not necessarily identified. Also, Dr. Hirsch is concerned that "chronic substance abuse" alone is assumed to be the reason for a fatal intoxication. If neither an investigation reveals a history of chronic substance abuse nor an autopsy discloses pathological stigmas of chronic substance abuse (e.g., track marks) in a fatal intoxication, "acute substance abuse" is identified as the cause. If <u>either</u> an investigation or an autopsy reveals that the person habitually abused drugs, both "acute and chronic substance abuse" is indicated on the death certificate.

From the Office of the Chief Medical Examiner, death certificates are sent to the New York City Department of Health's Registrar of Vital Statistics. In the past, the lag between time of death and final disposition of cause on the death certificate could take many months. Now, however, the time lag is probably less than two months. The Registrar of Vital Statistics is responsible for coding the cause of death from the death certificate. These codes are widely used in public health analyses and epidemiologic investigations. Unfortunately, the classification scheme used does not

provide the specificity needed to do the job. The International Classification of Diseases Ninth Revision (ICD 9) is currently the coding system used. The ability to single out specific drugs and combinations of drugs is impaired by omnibus categories of drugs. Unfortunately, "ICD 10", which will come into effect in the 1990s, does not appear to improve the situation.

What has complemented the existing situation for us, however, is the DAWN (Drug Abuse Warning Network) System. DAWN is a large-scale data collection system implemented in 1972 and designed as an indicator of the severity, scope, and nature of the nation's substance abuse problem. The purpose of DAWN is to provide data on the incidence of drug abuse related episodes and mentions of specific drugs in medical examiner cases as well as hospital emergency room episodes.

DAWN has participation from approximately 175 medical examiner jurisdictions throughout the United States, and is particularly valuable because it:

- Identifies specific drug(s) being used and is the only system which collects information on legal drugs (both prescription and over-the-counter) as well as illegal substances.
- Is ongoing and thus continually provides current and consistent information on drug abuse patterns/trends, and detects new substances/combinations of abuse.

To determine DAWN eligibility, a drug-related death must meet <u>all three</u> of the following criteria:

1. The death was induced by or related to drug abuse, regardless of whether the drug ingestion occurred minutes or months before the death and regardless of manner of death.
2. The case involved the nonmedical use of a legal drug or any use of an illegal drug.

3. The decedent's reason for taking the substance(s), if known, included one of the following: (1) dependence, (2) suicide, (3) psychic effects,

OR

(4) the homicide was induced by or directly related to use of a drug/substance(s).

Fortunately, Dr. Charles Hirsch participates in the DAWN system, and New York City is represented. For many years, New York City did not report to the DAWN system. As a result drug-related death statistics reported by DAWN for the United States represented a gross undercount. Experience in New York City is too important to be omitted in the national picture. DAWN now gives us in New York City an important alternative for assessing drug-related deaths, and therefore assessing the drug abuse problem.

In summing up, drug-related deaths have much utility in assessing the impact of the drug abuse problem in a variety of ways. Much, obviously, depends on the conceptual and technical ability to determine the drug-relatedness of a fatality. But the problem does not end there. Processing the data in a way that carefully and consistently specifies the associated characteristics of the death becomes essential. Only in that way can the utility of the information be maximized.

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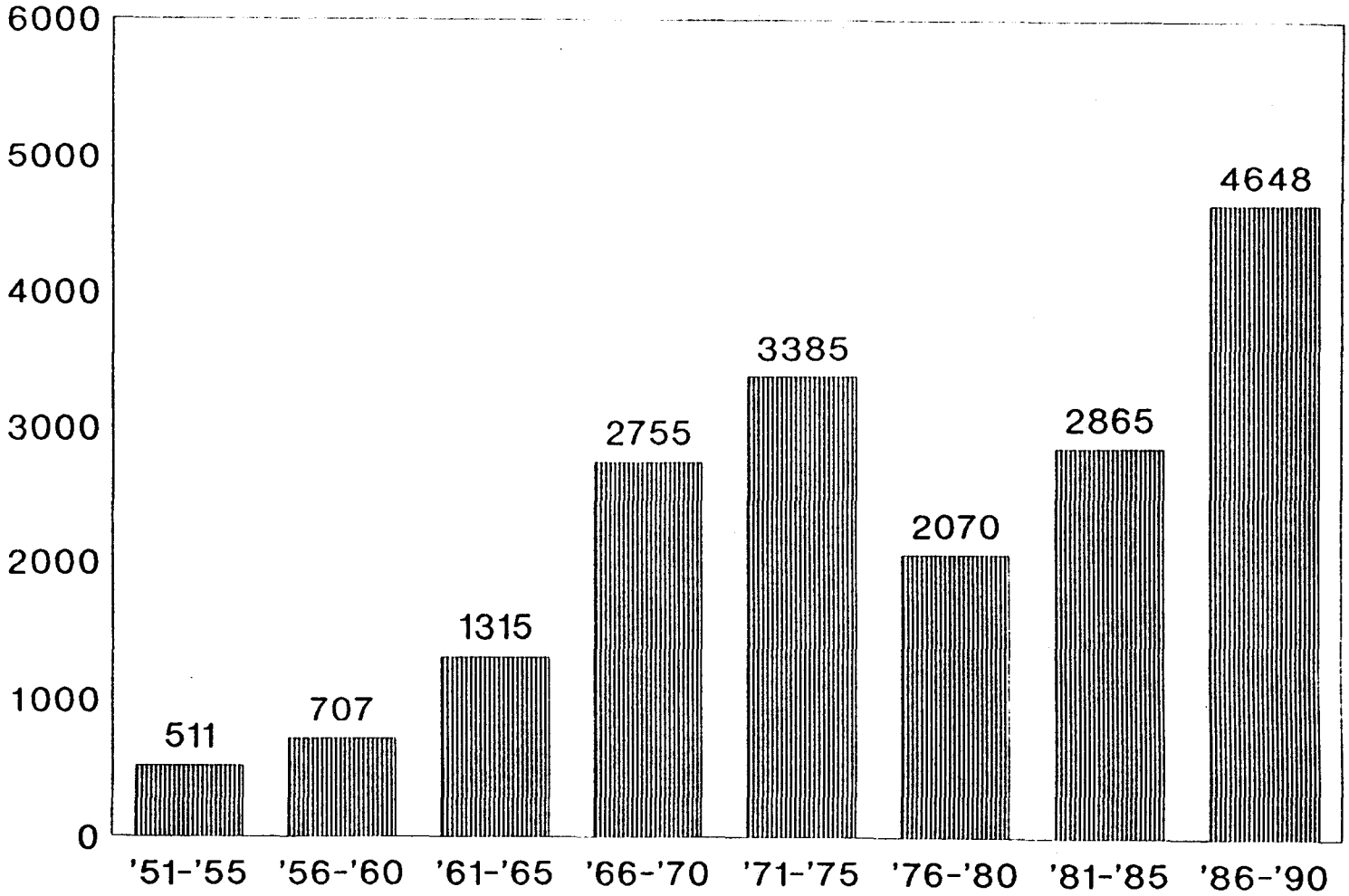
# DEATHS DUE TO DRUG ABUSE
## NEW YORK CITY, 1951-1990




Source: NYC Dept. of Health

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**" DRUG RELATED DEATHS "**

## MEETING PARIS, 25-26 October 1991

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