

# A prototype of an information system for assessing the health status of prison inmates

A. Duhamel<sup>1</sup>, E. Archer<sup>2</sup>, P. Devos<sup>1</sup>, M.C. Nuttens<sup>1</sup>, R. Beuscart<sup>1</sup>

<sup>1</sup> Department of Medical Informatics, CHRU LILLE (France)

<sup>2</sup> Prison psychiatric unit of Loos-Lez-Lille (France)

**Abstract.** A research-action program was established in 1996 between the Loos-Lez-Lille prison psychiatric unit and the Department of Medical Informatics of the University Hospital of Lille (France) : - (1) to investigate the health status and the general characteristics of the prison population - (2) to develop an Information System for improving the prison health care and to facilitate social rehabilitation of convicts. Starting off 1988, all new prisoners are interviewed on their arrival using a standard questionnaire. The transfer of all the information recorded in this questionnaire into a computer base was initiated in 1996, when the research action program began. A statistical analysis was performed on 15200 records (1989-1995) to identify the most informative parameters : 50% of inmates were less than 24 years old; 57% were unemployed; 60% had no professional qualification. 31% of inmates had a psychiatric history and 16% had made a previous suicide attempt. The rate of drug abuse has increased from 24% in 89 to 53% in 95. To analyze the time trends of these parameters, a prototype of Information System was then developed. The system uses the database to produce standard reports in real time.

## 1. Problem

Prison inmates are exposed to major risk factors : suicide attempts, illicit drug use, excessive drinking, psychiatric disorders ... The rise in juvenile delinquency, the modification of the nature of crimes committed as well as the expansion of the prison population all make it increasingly important to produce epidemiological data in this field. In spite of this need however, very few studies concerning the French inmate population have so far been published. Excepted the demographic data provided by the Department of Justice, existing studies were either restricted to small samples or to particular problems such as sexually transmitted diseases. The other published results concern essentially the North American or British prison population and they have focused on the prevalence of mental illness or substance misuse.

In North American studies, between 50% to 80% of prisoners (on remand or sentenced) were diagnosed as having a history of lifetime abuse or of dependence on alcohol and between 30% to 60% abused or were dependent of illicit drugs. Prevalence of mental illness was estimated between 5% to 42% [1]. In a recent study among the inmates in England, 71% of males were considered to require medical help directly for their drug or alcohol abuse and the rate of psychiatric disorders was estimated at 26% [2]. These results show that there is a great variability in the rates of findings reported according the studies and the countries. However it's quite obvious that these disorders far exceed those found in the general population.

## 2. Objectives

A research-action program was established in 1996 between the prison psychiatric unit of Loos-Lez-Lille and the Department of Medical Informatics of the University Hospital of Lille (France). The Loos-Lez-Lille jail is a French prison for remand and short sentenced prisoners. It houses 1200 inmates and has an average number of 2200 arrivals a year.

The aims of this project were :

- (1) to assess the health status and the general characteristics of the prison population
- (2) to analyse the time trends of these characteristics
- (3) to build an information system intended to contribute to the improvement of prison health care and to facilitate the prevention of the jail recidivism.

## 3. Method

Starting from the 1st January 1988, all new prisoners are interviewed at their arrival into the prison by the psychiatric doctor or one of two trained clinical psychologists. A pilot study was initially undertaken from January to June 1988 to build a standard questionnaire. The questionnaire gathered information regarding demographic data, education and socio-economic level, arrest charge, social and family history, lifestyle, medical and psychiatric history, suicidal ideation, and drug, alcohol or smoking abuse. During the pilot study, interrater reliability was monitored. This was achieved by a procedure whereby one of the three aforementioned persons (doctor, psychologists) conducted an interview with the new prisoner while the others listened. The three of them subsequently recorded the questionnaire independently. A total of 130 prisoners were interviewed in this manner. For the questions relating to psychiatric disorders, substance abuse as well as for their appreciation of the prisoner's behavior during the interview, the agreement between raters was measured by means of Kappa coefficients. Questions with mean inter-rater reliability less than 90% were either modified or discarded.

Since the 1st July 1988, the "interviewers" (psychiatric doctor or psychologist) have used the questionnaire which requires 30 minutes to administer. Prisoners are informed that the interview is confidential, that any information disclosed will not be passed on to prison staff and that the collected data are included in their medical record.

The prototype was developed between 1996 and 1997. All the questionnaires collected from 1 January 1989 through 30 June 1996 were first anonymously recorded. Data acquisition was performed within the prison by an informatic service company. Statistical analysis was then performed using the SAS software. This analysis allowed to determine the characteristics of the prison population and to identify the most informative variables. The third step involved the transfer of data into a database developed with the ACCESS/WINDOWS DBMS. This database was designed using the questionnaire and the results of the statistical analysis.

Finally, a system for the production of standard reports was designed using EXCEL/WINDOWS and connected to the database. This system gives the possibility of having an comprehensive summary of the jail population (curves, charts ...) in real time and allows for the analysis of the time trends of various variables (Figures 1a, 1b). From the 1st July 1997, the questionnaires of new prisoners are recorded after interview using the database interface (questionnaires from 1 July 96 through 30 June 97 are yet to be recorded).

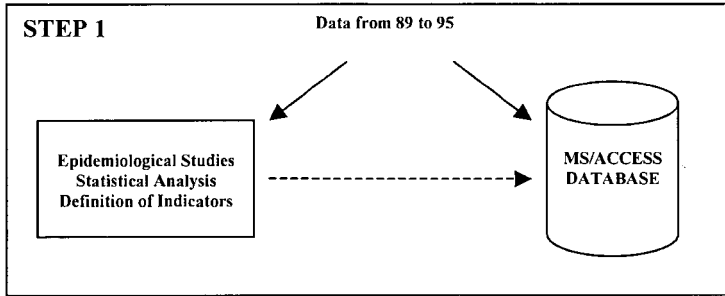


Figure 1a

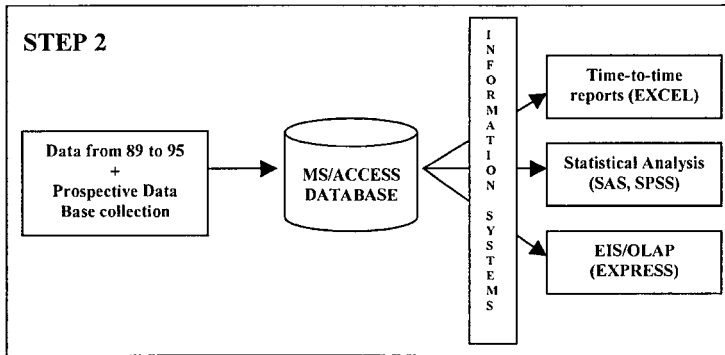


Figure 1b

#### 4. Results

We present the preliminary results of data collected from 1989 to 1995 (15200 records, figures 2a,2b,2c).

*Demographic data and arrest charges* : The prisoners are young people : 17% were less than 19 years old and 85% were below 35. (mean /median age = 27 /24 ). More than 97% were male. A lot of them were unmarried (61%). Unemployment rate was extremely high (56.7%). This rate was 65% for the inmates between 25-50 years old in 1995.

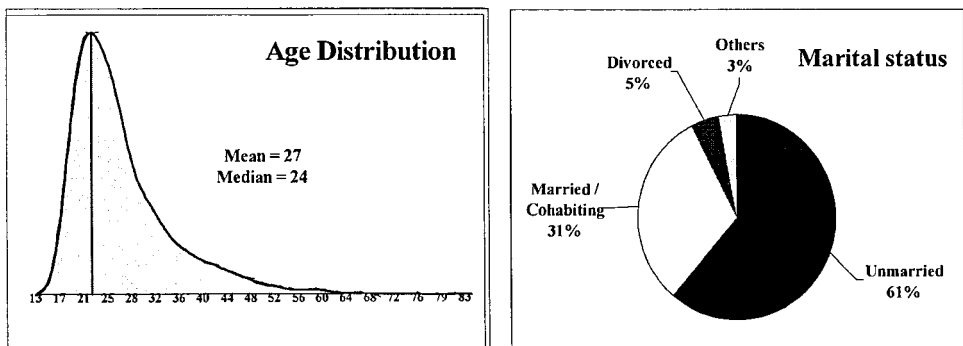


Figure 2a

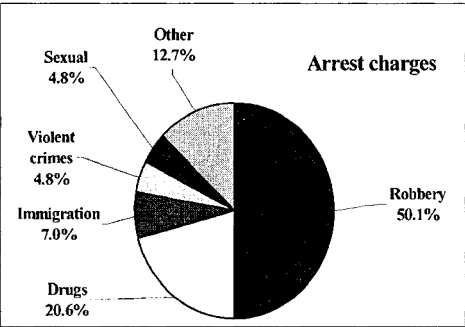


Figure 2b

The rate of robberies was higher than the national figure (50% versus 40%) while the rate of sexual offences was lower (5% versus 13%). The rates of others offences were sufficiently close to the national rates. For all the offences studied, the evolution between 1989 to 1995 as identical to that identified by the Department of Justice : increase in drug related and sexual offences and decrease in robberies.

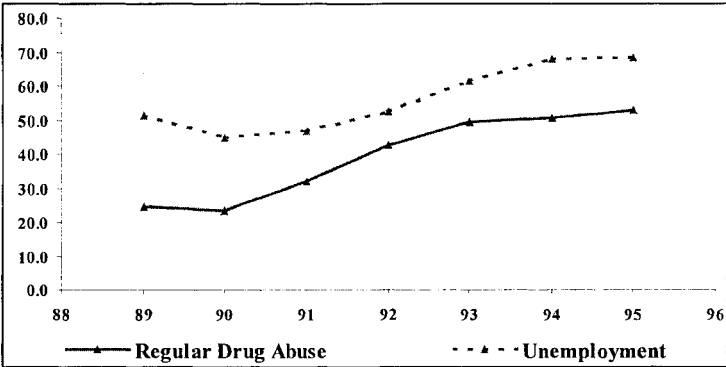


Figure 2c

*Education level* : 60% of inmates had no professional qualification. 51% had left the education system before 16 years old.

*Substance abuse* : The rate of substance abuse disorders was extremely high. 21% had a regular alcohol consumption and 40% were regular drug abusers. Amongst them, 77% used heroin.

*Medical data* : 31% had a psychiatric history. 8% had previous suicidal ideation and 16% a previous suicide attempt. Among the prisoners with psychiatric disorders and/or drug abuse, 69% had not received any form of care from the existing health care system.

*Evolutionary Data* : the analysis of evolutions between 89 to 95 showed (Figure 2c):

- unemployment rate increased from 45% in 1989 to 68% in 1995 ( $p<0.001$ , chi-square test)
- an increase in the rate of psychiatric history (from 27% in 89 to 37% in 95,  $p<0,001$ ) and suicide attempt (from 15% in 89 to 18% in 95,  $p<0,001$ )
- a meteoric rise in drug abuse from 24% in 1989 to 53% in 1995 ( $p<0,001$ ).

## 5. Discussion and conclusion

A typical inmate is a young man, with no job and a poor level of education, arrested for robbery or drug misuse. He has often a psychiatric history and/or substance use disorders, is likely to have a multidrug habit and needs multidisciplinary assistance. Some of these findings are not surprising but they had never been quantified before in France. The rate of psychiatric disorders found in our study (31%) is close that observed by Mason [2] in England (26%) and in the range of those reported by Powell [1] in USA. The rate of drug abuse (40%) is in the range of those reported in the USA (30% - 60%) [1]. Our study shows a pronounced increase of this rate from 89 to 95. Most prisoners are released after a short period and without any adequate detoxification program the problem of drug use in prisons will inevitably spill over into the community.

The results of this study demonstrate the relevance of an information system for improving the monitoring of the jail population. It provides information in real time thus enabling the concerned prison personnel to adapt jail management, to improve the health care of prisoners as well as that of released inmates. It can be used to define an efficient policy for the reduction of the recidivism of prison sentences.

## References

- [1] T.A. Powell, J.C. Holt, K.M. Fondacaro, *The prevalence of mental illness among inmates in rural state, Law and Human Behavior*, Vol. 21, N°4, 427-438, 1997.
- [2] D. Mason, L. Birmingham, D. Grubin, *Substance use in remand prisoners : a consecutive case study, BMJ*, Vol. 315, 18-21, 1997.

*This work was supported by the Region and the justice department of Nord Pas de Calais.*