History and Medicine: *ex voto* as a tool for health and epidemiological surveillance


Key words: History of medicine, epidemiological study, public health
Parole chiave: Storia della medicina, studio epidemiologico, sanità pubblica

Abstract

**Background.** Ex voto is a donation for a divinity, a Saint or to Virgin Mary for a received mercy. From the analysis of an ex voto it’s possible to obtain lots of information and therefore it can be used as a tool for health and epidemiological surveillance, to study morbidity in the past. The aim of this study was the creation of a database to rebuild epidemiological events and diseases, using ex voto as a source of health surveillance.

**Methods.** We chose to study votive pictures using three types of sources: photographed alive, on-line archives, books and photographic collections. Ex voto have been saved in an Hard Disk, numbered and inserted in a database, then analyzed using Stata®.

**Results.** A total of 6231 ex voto were collected and catalogued in our database. Ex voto referring to diseases are the most represented (41%), but they have decreased with the time. Road accidents (21.4%) have a constant increase, especially with the appearance of cars and motorcycles. Aggressions (5.45%) decrease constantly; warlike accidents (4.44%) had a peak in the period including both world wars; non professional accidents (10.60%) and accidents at work (3.79%) increase without peaks; maritime accidents (8.88%) have not uniform ups and downs during the time.

**Conclusions.** The database let us rebuild epidemiological events of the past, which are not deductible from other sources. Our purpose is to expand in the space-time our source data in order to perform an interesting comparison between past and present.

Introduction

"Ex voto" is a Latin shortened expression, from "ex voto suscepto", that could be translated as “from the vow made” or “in gratitude, devotion” (1-3). *Ex voto* are donations for a divinity or, in the catholic culture, to a Saint or to Virgin Mary (mother of Jesus Christ), for a received mercy (4).
The use of *ex voto* as tools to rebuild the epidemiological events of the past

There are several types of *ex voto* and, in particular: jewels, votive plates, anatomic objects, wedding dresses, photos, hair braids, embroidery, chains or fetters offered by sailors escaped from pirates’ attacks, weapons of soldiers who survived the war and, finally, painted tablets which are full of information about received mercy, year, place, socio-economic status, age and the intervened Saint (5-7). They can be generally found in churches, in shrines, or in other places of worship. *Ex voto* tradition was born in a non-Christian context: Egyptians, Arabs, Jews, Greeks and Romans used to offer an *ex voto* to their gods. Egyptians offered anthropomorphic statuettes to their gods. The Book of Kings describes the tradition of *ex voto* in Jewish culture; in Islamic culture bids were thrown into the so-called “Zamzam wells”; archeological remains of anatomic *ex voto* were found also in ancient Rome, in ancient Greece, and in Etruria (8-11). This practice still popular finds its highest expression from the Middle Ages and in the Catholic and Orthodox culture (12), especially in Italy.

In Italy shrines containing votive objects are distributed throughout all the national territory, with some churches and shrines containing hundreds or thousands votive objects, especially in Southern Italy (13, 14). From the analysis of an *ex voto* it is possible to obtain information about customer’s age, sex or class, event’s period and type (Fig. 1).

Because of its versatility the *ex voto*, in addition to a religious and cultural value, represents a documentary source of the history of a territory: economic, social and political history but also daily history of religious people, that entrust their fate to a Saint or to Virgin Mary in the most crucial moments of their lives. Because of the wealth of contained information, some types of *ex voto*, such as photos, votive plates, or painted tables, could be used to study morbidity in the past, when there wasn’t a systematic collection of data about death and infectious diseases: therefore they represent a kind of a tool for health and epidemiological surveillance.

The aims of this study have been: I) the creation of a database that could be used as a tool for a retrospective epidemiological and socio-cultural research; II) to rebuild epidemiological events and diseases, when traditional informative sources didn’t exist, using only *ex voto* as an *ante litteram* instrument for health surveillance.

**Materials and methods**

A total of 6,231 *ex voto* have been collected, catalogued and inserted in our database; despite the wide variety of objects, we chose to study votive pictures because of the richness the information they could provide, fundamental for an “empirical” epidemiological research:

1,271 were inadequate because of the lack of the most important informations, so in our study we included 4,460 votive tablets, collected throughout Italian territory using three types of sources: (a) photographed alive...
(56%), obtained from Livorno, Grosseto, Pistoia, Napoli, Genoa and Poggibonsi; (b) on-line archives (31%); (c) books and photographic collections (13%).

*Ex voto* have been saved in a hard disk, numbered and then inserted in a database using Microsoft Excel with 11 fields organized in:
- ID: an univocal identificative value
- source: photographed alive, taken from books, or collected from the web
- *ex voto* type: photographs, wood, fabric or metal tablets
- shrine: the name of the shrine where the *ex voto* was placed
- region: the belonging Italian region of the *ex voto*
- geographic area: macrogeographical aggregation (North, Central, or Southern Italy)
- sex: male or female
- age: adult or child
- social class: the social class of the petitioner divided in three classes (High, medium and low)
- category: 11 different categories to identify the type of accident (see below)
- day, month, year, century: the date, or the time period of the *ex voto*

The identification of the social class followed an universal method of judgment, based on the dimension, the setting and the appearance of the represented character (15). We identified 11 *ex voto* categories: accidents at work, non professional accidents, crashes, diseases, natural events, accidents with non warlike weapons, warlike accidents, aggressions, diseases affecting animals, maritime accidents, other (not included in the previous categories), according to the criteria proposed by R. Grimaldi of Asclepius Project (15).

Chi-square test and Spearman correlation have been calculated using the data extracted from the database, using Stata® SE, version 12.1 (StataCorp, College Station, Texas, USA).

**Results**

Database analysis showed that the most represented types of *ex voto* are: diseases (41.0%), road accidents (21.4%), and non professional accidents (10.60%), followed by maritime accidents (8.88%), warlike accidents (4.44%) and accidents at work (3.79%) (Fig. 2).

Some types of *ex voto* seem to increase over the centuries: accidents at work from 0.89% to 5.31%, non professional accidents from 6.86% to 10.09%, road accidents from 4.77% to 28.71% and warlike accidents from 0.29% to 6.24% (especially in the 20th century, when two World Wars took place); otherwise diseases lessen from 77.61% to 42.24% and aggressions from 6.86% to 3.33%. Maritime accidents’ trend has a peak in the 19th century with a percentage of 17.78% decreasing in the 20th century to 4.09%. In the subcategory “aggressions” it is evident that aggressions
The use of *ex voto* as tools to rebuild the epidemiological events of the past

by men, such as duels or thefts, are always higher than aggressions by animals, but in the 20\textsuperscript{th} century the trend reversed with 56\% aggressions by animals and 32\% by men.

A further analysis using Chi-square test shows that in the higher social class aggressions are attributable to men (p<0.001), otherwise in the lower these are attributable to animals; the higher class has also a higher exposure to diseases (54.34\%; p<0.001).

On the other hand the lower class has a higher exposure to accidents at work and non professional accidents (p<0.001); the medium class to warlike accidents.

In the group “diseases” there is also a distribution between the social classes: childbirths and infectious diseases are higher in the higher class, haemorrhagic diseases (in particular hemoptysis) and surgery in the medium; childhood diseases, neuro-psychiatric and osteo-articular diseases in the lower.

The geographical analysis shows that in the South the proportion of *ex voto* for diseases (70.8\%) and aggressions (65.02\%) is higher; in the North it is higher for warlike accidents (70.2\%); the other distributions are relatively homogeneous.

*Ex voto* from the male gender are the most represented in all categories of events, with the exception of *ex voto* connected with diseases which are higher in women instead (69.64\%).

In the category “children” the most represented *ex voto* are non professional accidents (40.68\%), followed by diseases (18.03\%) and road accidents (15.81\%). Sex differences in the children change over the centuries: in the 16\textsuperscript{th}, 17\textsuperscript{th} and 18\textsuperscript{th} century girls are sharply less represented than boys. Only in the 19\textsuperscript{th} and 20\textsuperscript{th} century this percentage increases. This datum is confirmed by Spearman correlation index $\rho = 0.044$ and p<0.006.

**Discussion and conclusions**

In the analyzed period of time, 16\textsuperscript{th} through 20\textsuperscript{th} century, *ex voto* attributable to diseases of the young and the adult are the most represented but they decrease with the time, probably because of medical-scientific and public health progresses (e.g. antibiotics, vaccines, personal and environmental hygiene). On the other hand, road accidents have a constant increase, especially in 20\textsuperscript{th} century with the spreading of cars and motorcycles.

Aggressions decrease constantly: duels and robberies, and animal attacks lessen, because of the improvement of social conditions and lower promiscuity between men and animals. But, in line with a retrospective study “*Historical data about cases of anthropophagy of wolf*” (16), aggressions from animals increased in the 19\textsuperscript{th} century.

Warlike accidents have a peak in the 20\textsuperscript{th} century, due to the two world wars; non professional accidents increase without peaks; maritime accidents have not uniform ups and downs during the time, but the evident peak in the 19\textsuperscript{th} century is probably due to piracy.

Accidents at work increase also: this is an interesting datum because of the increased security at work should make an accident at work increasingly anomalous. But we know that the culture of safety has not grown accordingly!

Female sex is less represented in the *ex voto*: this phenomenon is probably due to a chauvinism extremely spread in the past which made more important the diseases which affect male gender (17).

Events regarding children were especially non professional accidents, probably because children got hurt playing at home or in the garden. The increase of the diseases affecting children is inversely proportional to infant mortality: this implies that the social value of the children increases during the time.
Geographical distribution of the *ex voto* shows that in the North there are numerous accidents at work, probably as a consequence of a earlier industrial development; this difference is perceptible also today (18).

The major limits to our study were the sample size, because it’s difficult to estimate the real number of all *ex voto*; a non uniform distribution of collected data from the geographical point of view, especially in the central Italy; the religiosity, because only a part of population who survived a disease or an accident produced *ex voto*. However, no study on this topic has been carried out in such a systematic and extendend way in Italy and in the world. The first study was in fact carried out in 1892 by an important Italian folklorist, Giuseppe Pitrè, who collected almost thirty votive tablets, now stored up in Pitrè Museum in Palermo (19).

Another important socio-anthropologic study was carried out by R. Grimaldi with the Asclepius Project of the University of Turin, with the collection of votive pictures in Piedmont (20).

Concluding, the most important result of our work is the creation of the database. Through the analysis of the database we rearranged epidemiological events of the past, when there were not other reliable sources, at least in our Country. Diseases are the most important cause of an *ex voto*, but they decreased with the time. Road accidents have a constant increase, especially with the spread of cars and motorcycles. Aggressions decrease constantly; warlike accidents had a peak due to the two world wars; non professional accidents and accidents at work increase without peaks; maritime accidents have not uniform ups and downs during the time. Our work is therefore a bridge which connects sociology, economics and epidemiology, and represents an important element for the health information system, but also for the scientific and humanistic communities. Our purpose is to continue this study, enlarging progressively the sample size and the geographical coverage, and to expand also the time span of our social and epidemiological review in order to perform an interesting comparison between past and present.

**Riassunto**

*Storia e Medicina: gli ex voto come strumento per la sorveglianza epidemiologica*

**Introduzione.** Un *ex voto* è una donazione offerta a una divinità, a un santo o alla Madonna per una grazia ricevuta. Dall’analisi di *ex voto* è possibile ottenere molte informazioni; di conseguenza essa può essere utilizzata come strumento per studiare l’epidemiologia del passato. Lo scopo di questo studio è stata la creazione di un database per ricostruire gli eventi e le principali malattie del passato, usando gli *ex voto* come fonte di sorveglianza sanitaria.

**Metodi.** Abbiamo scelto di studiare le immagini votive utilizzando tre tipi di fonti: fotografate dal vivo, archivi on-line, libri e collezioni fotografiche. Gli *ex voto* sono stati salvati in un Hard Disk, numerati e inseriti in un database, quindi analizzati utilizzando Stata®.

**Risultati.** Un totale di 6231 *ex voto* sono stati raccolti e catalogati nel nostro database. Gli *ex voto* attribuibili a malattie sono i più rappresentati (41%), sebbene la loro frequenza diminuisca nel tempo. Gli *ex voto* dovuti a incidenti stradali (21,4%) hanno un aumento costante, in particolare con l’introduzione di auto e moto. Le aggressioni (5,45%) diminuiscono costantemente; gli incidenti di guerra (4,44%) hanno un picco nel 20° secolo a causa delle due guerre mondiali; gli infortuni non professionali (10,60%) e gli infortuni sul lavoro (3,79%) aumentano senza picchi; infine gli incidenti marittimi (8,88%) hanno andamenti non costanti nel tempo.

**Conclusioni.** Il database ci ha permesso di ricostruire gli eventi epidemiologici del passato, che non sono deducibili da altre fonti. Il nostro scopo è quello di ampliare la nostra ricerca nello spazio e nel tempo al fine di ottenere ulteriori informazioni e fare un interessante confronto tra passato e presente.

**References**

The use of *ex voto* as tools to rebuild the epidemiological events of the past


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