John Graunt on Causes of Death in the City of London

Source: *Population and Development Review*, Jun., 2009, Vol. 35, No. 2 (Jun., 2009), pp. 417-422

Published by: Population Council

Stable URL: https://www.jstor.org/stable/25487673

John Graunt on Causes of Death in the City of London

Few disciplines can have as well-accepted a point of origin as Graunt's Observations *bears to the subsequent development of demography. Published in 1662 under the full title* Natural and Political Observations Mentioned in a following Index, and made upon the Bills of Mortality, *with the author identified as John Graunt, Citizen of London (and with a subtitle:* With reference to the Government, Religion, Trade, Growth, Ayre, Diseases, and the several Changes of the said City), *this small book was immediately recognized as a pioneering study in social accounting—what came to be called political arithmetic. Its distinctive contribution was in discerning statistical regularities and probabilities from raw and error-prone vital registration data. Graunt's purpose, as he notes in the Preface, was not to engage in speculation but rather to "present the World with real fruit from those ayrie blossoms." The blossoms in question were the annual summaries of the weekly records of burials and baptisms (the "bills of mortality") maintained by parish clerks. The burial records did not include age but, from 1629 onward, did provide a cause of death as ascribed by "the searchers," the "ancient matrons" whose job was to examine each case.*

The Observations *covers a variety of topics. It gives an estimate of the population of London (some 460,000) derived from numbers of baptisms and deaths; calculates the city's natural decrease and migrant inflow; comments on the level and stability of sex ratios; and offers a table of cohort survivorship (albeit with informed guesses for successive 10-year survivorship rates beyond childhood, in the absence of age distribution data: the first proper life table, Edmund Halley's for Breslau [Wroclaw], was published in 1693). Most of Graunt's attention, however, is devoted to causes of death: their classification, absolute and relative numbers, and rates, and interpretations of levels and trends. Chapter 2, titled General Observations upon the Casualties, is reproduced below; several subsequent chapters delve into more detail about specific causes, in particular the plague. With scant agreement on disease etiology in this pre-germ-theory era, consistency in classification of causes was hardly to be expected. A glossary of ob-*

scure names of causes mentioned in Chapter 2 is set out on page 419. The full Table of Casualties, folded-in at the end of the volume, lists 81 distinct causes. Many of Graunt's "observations" require heroic assumptions, such as his estimate of deaths under age 6—36 percent of live births—based on the incidence of causes mainly found in early childhood (§12 and 13). The text table in §17 (shown in facsimile on this page) lists "some of the more formidable and notorious diseases," presenting recorded numbers of deaths in the 20 years covered by his data during which total deaths amounted to 229,250—making the point of their rarity. A few years later, the London bill of mortality for 1665, the year of the Great Plague, shows 97,306 burials in that year alone, of which 68,598 were deaths from plague.

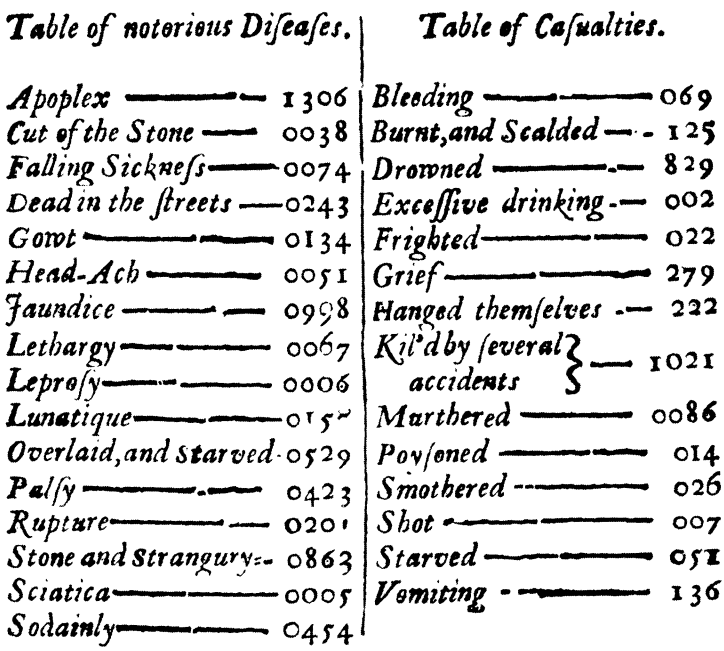

Table of notorious Diſeaſes.		Table of Caſualties.	
Apoplex	1306	Bleeding	069
Cut of the Stone	0038	Burnt, and Scalded	125
Falling Sickneſs	0074	Drowned	829
Dead in the ſtreets	0243	Exceſſive drinking	002
Gowt	0134	Frighted	022
Head-Ach	0051	Grief	279
Jaundice	0998	Hanged themſelves	222
Lethargy	0067	Kil'd by ſeveral accidents	1021
Leproſy	0006	Murthered	0086
Lunatique	015	Poyſoned	014
Overlaid, and ſtarved	0529	Smothered	026
Palſy	0423	Shot	007
Rupture	0201	Starved	051
Stone and Strangury	0863	Vomiting	136
Sciatica	0005		
Sodainly	0454		

While Graunt has the rightful claim of progenitor in the statistical study of causes of death, the modern scheme of classification is mainly the outcome of several decades of effort by medical statisticians, notably William Farr and Jacques Bertillon, in the nineteenth century. In 1900 what was termed the Bertillon classification was adopted as the first international standard. Successive revisions have refined and greatly elaborated the scheme: the tenth, the International Statistical Classification of Diseases and Related Health Problems—Tenth Revision *(ICD-10), was adopted by the World Health Organization in 1989.*

Graunt was born in 1620 and died in 1674. The Observations, *his only surviving work, went through several editions during his lifetime but was little changed. Its influence in demography can be traced through the writings of his contemporary William Petty and, in the next generation Gregory King; and in the eighteenth century*

through the development of actuarial analysis. The chapter reprinted below uses the first edition text but is modernized in several respects to make for greater readability. The flavor of the original is given by the table above; for purists, a full facsimile is printed in The Earliest Classics: John Graunt and Gregory King, *ed. Peter Laslett (Farnborough, UK: Gregg International, 1973).*

Glossary of causes of death mentioned below

Ague	Malaria or fever	*Mother (Mother-fits)*	"Womb sickness," hysteria
Apoplexy	Stroke	*Overlaid*	Smothered
Bloody-flux	Dysentery	*Planet-strucken*	Any sudden affliction
Chrisome	Infant death before or soon after baptism	*Purples*	Subcutaneous bleeding
		Rising of the lights	Croup
Cut of the stone	Gallstone surgery	*Scald-head*	Scalp disease, ringworm
Dropsy	Edema	*Scouring*	Probably dysentery
Falling sickness	Epilepsy	*Spotted fever*	Typhus
Frighted	Probably heart attack or stroke	*Stone*	Gallstones
		Strangury	Urinary disease
Impostume	Abscess	*Teeth*	Infant death during teething
King's-evil	Scrofula		
Liver-grown	Enlarged liver	*Wen*	Tumor, cyst

In my discourses upon these Bills I shall first speak of the casualties, then give my observations with reference to the places and parishes comprehended in the Bills, and next of the years and seasons.

1. There seems to be good reason why the Magistrate should himself take notice of the numbers of burials and christenings, viz. to see whether the City increase or decrease in people; whether it increase proportionably with the rest of the nation; whether it be grown big enough, or too big, &c. But why the same should be made known to the people, otherwise than to please them as with a curiosity, I see not.

2. Nor could I ever yet learn (from the many I have asked, and those not of the least sagacity) to what purpose the distinction between males and females is inserted, or at all taken notice of; or why that of marriages was not equally given in? Nor is it obvious to everybody why the account of the casualties (whereof we are now speaking) is made? The reason which seems most obvious for this latter is: That the state of health in the City may at all times appear.

3. Now it may be objected that the same depends most upon the accounts of epidemical diseases, and upon the chief of them all, the *plague*; wherefore the mention of the rest seems only matter of curiosity.

4. But to this we answer: That the knowledge even of the numbers which die of the *plague* is not sufficiently deduced from the mere report of the searchers, which only the Bills afford; but from other ratiocinations, and comparings of the *plague* with some other casualties.

5. For we shall make it probable that, in years of *plague*, a quarter part more dies of that disease than are set down; the same we shall also prove by the other casualties. Wherefore, if it be necessary to impart to the world a good account of some few casualties, which since it cannot well be done without giving an account of them all, then is our common practice of doing so very apt and rational.

6. Now, to make these corrections upon the perhaps ignorant and careless searchers reports, I considered first of distinguishments: and finding that many of the casualties were but matter of sense, as whether a child were *abortive* or *stillborn*; whether men were *aged*, that is to say, above sixty years old or thereabouts when they died, without any curious determination whether such aged persons died purely of *age*, as for that the innate heat was quite extinct, or the radical moisture quite dried up (for I have heard some candid physicians complain of the darkness which themselves were in hereupon), I say that these distinguishments being but matter of sense, I concluded the searchers report might be sufficient in the case.

7. As for *consumptions*, if the searchers do but truly report (as they may) whether the dead corpse were very lean and worn away, it matters not to many of our purposes whether the disease were exactly the same as physicians define it in their books. Moreover, in case a man of seventy five years old died of a *cough* (of which had he been free, he might have possibly lived to ninety) I esteem it little error (as to many of our purposes) if this person be, in the table of casualties, reckoned among the *aged* and not placed under the title of *coughs*.

8. In the matter of *infants* I would desire but to know clearly what the searchers mean by *infants*, as whether children that cannot speak, as the word infant seems to signify, or children under two or three years old, although I should not be satisfied whether the infant died of *wind*, or of *teeth*, of the *convulsion*, &c. or were choked with *phlegm*, or else of *teeth*, *convulsion*, and *scouring*, apart or together, which, they say, do often cause one another: for, I say, it is somewhat to know how many die usually before they can speak, or how many live past any assigned number of years.

9. I say, it is enough if we know from the searchers but the most predominant symptoms: as that one died of the *head-ache*, who was sorely tormented with it though the physicians were of opinion that the disease was in the stomach. Again, if one died suddenly, the matter is not great whether it be reported in the Bills, *suddenly*, *apoplexy*, or *planet-strucken*, &c.

10. To conclude, in many of these cases the searchers are able to report the opinion of the physician who was with the patient, as they receive the same from the friends of the defunct, and in very many cases, such as *drowning*, *scalding*, *bleeding*, *vomiting*, *making-away themselves*, *lunatics*, *sores*, *small-pox*, &c., their own senses are sufficient, and the generality of the world are able pretty well to distinguish the *gout*, *stone*, *dropsy*, *falling-sickness*, *palsy*, *agues*, *pleurisy*, *rickets*, &c. one from another.

11. But now as for those casualties which are aptest to be confounded and mistaken, I shall in the ensuing discourse presume to touch upon them so far as the learning of these Bills hath enabled me.

12. Having premised these general advertisements, our first observation upon the casualties shall be: that in twenty years, there dying of all diseases and casualties 229250, that 71124 died of the *thrush, convulsion, rickets, teeth,* and *worms,* and as *abortives, chrisomes, infants, liver-grown,* and *overlaid;* that is to say, that about ⅓ of the whole died of those diseases which we guess did all light upon children under four or five years old.

13. There died also of the *small-pox, swine-pox,* and *measles,* and of *worms* without *convulsions,* 12210, of which number we suppose likewise that about ½ might be children under six years old. Now, if we consider that 16 of the said 229 thousand died of that extraordinary and grand casualty, the *plague,* we shall find that about thirty-six per centum of all quick conceptions died before six years old.

14. The second observation is: That of the said 229250 dying of all diseases, there died of acute diseases (the *plague* excepted) but about 50000, or 2/9 parts. The which proportion doth give a measure of the state and disposition of this climate and air as to health, these acute and epidemical diseases happening suddenly, and vehemently, upon the like corruptions and alterations in the air.

15. The third observation is: That of the said 229 thousand about 70 died of chronical diseases, which shews (as I conceive) the state and disposition of the country (including as well its food, as air) in reference to health, or rather to longævity: for as the proportion of the acute and epidemical diseases shews the aptness of the air to sudden and vehement impressions, so the chronical diseases shew the ordinary temper of the place, so that upon the proportion of chronical diseases seems to hang the judgment of the fitness of the country for long life. For I conceive that in countries subject to great epidemical sweeps men may live very long, but where the proportion of the chronical distempers is great, it is not likely to be so; because men being long sick and always sickly cannot live to any great age, as we see in several sorts of metal-men, who although they are less subject to acute diseases than others, yet seldom live to be old, that is, not to reach unto those years which David says is the age of man.

16. The fourth observation is: That of the said 229000 not 4000 died of outward griefs, as of *cancers, fistulas, sores, ulcers, broken and bruised limbs, impostumes, itch, king's-evil, leprosy, scald-head, swine-pox, wens,* &c., viz. not one in 60.

17. In the next place, whereas many persons live in great fear and apprehension of some of the more formidable and notorious diseases following, I shall only set down how many died of each: that the respective numbers, being compared with the total, 229250, those persons may the better understand the hazard they are in.

Table of notorious diseases		Table of casualties	
Apoplexy	1306	Bleeding	69
Cut of the stone	38	Burnt, and Scalded	125
Falling sickness	74	Drowned	829
Dead in the streets	243	Excessive drinking	2
Gout	134	Frighted	22
Head-ache	51	Grief	279
Jaundice	998	Hanged themselves	222
Lethargy	67	Killed by several accidents	1021
Leprosy	6	Murdered	86
Lunatic	158	Poisoned	14
Overlaid, and Starved	529	Smothered	26
Palsy	423	Shot	7
Rupture	201	Starved	51
Stone and Strangury	863	Vomiting	136
Sciatica	5		
Suddenly	454		

18. In the foregoing observations we ventured to make a standard of the healthfulness of the air from the proportion of acute and epidemical diseases, and of the wholesomeness of the food from that of the chronical. Yet, forasmuch as neither of them alone do shew the longævity of the inhabitants, we shall in the next place come to the more absolute standard and correction of both, which is the proportion of the *aged*, viz. 15757, to the total 229250. That is of about 1 to 15, or 7 per cent. Only the question is, what number of years the searchers call aged, which I conceive must be the same that David calls so, viz. 70. For no man can be said to die properly of *age* who is much less: it follows from hence, that if in any other country more then seven of the 100 live beyond 70, such country is to be esteemed more healthful than this of our City.

19. Before we speak of particular casualties, we shall observe that among the several casualties some bear a constant proportion unto the whole number of burials; such are chronical diseases and the diseases whereunto the City is most subject, as for example, *consumptions, dropsies, jaundice, gout, stone, palsy, scurvy, rising of the lights,* or *mother, rickets, aged, agues, fevers, bloody-flux,* and *scouring*: nay, some accidents, as *grief, drowning, men's making away themselves,* and being *killed by several accidents,* &c., do the like, whereas epidemical and malignant diseases, as the *plague, purples, spotted-fever, small-pox,* and *measles,* do not keep that equality, so as in some years or months there died ten times as many as in others.