A DIALOGUE WITH FLORENCE NIGHTINGALE

Alice Richardson
University of Canberra, Australia
John Maindonald
Australian National University, Australia
alice.richardson@canberra.edu.au

On her death in 1910, Florence Nightingale left a vast collection of reports, letters, notes and other written material. There are numerous publications that make use of this material, often highlighting Florence's attitude to a particular issue. In this paper we gather a set of quotations and construct a dialogue with Florence on the subject of maternity hospitals. Our dialogue draws attention to strong points of connection between Florence's use of statistics and modern evidence-based approaches to medicine and public health. We offer our dialogue as a memorable way to draw the attention of students of both statistics and health sciences to the key role of data-based evidence in medicine and in the conduct of public affairs. These are issues that were important in Florence's time, and remain important.

INTRODUCTION

Florence Nightingale (1820 – 1910) made remarkable use of her ninety years of life. She was the second of two daughters, born in England to wealthy and well-connected parents. At the age of 32, frustrated by her life as a gentlewoman, she found herself a position as Superintendent of a hospital for sick governesses. Additionally she cooperated with Sidney Herbert, a family friend who was by now a Cabinet minister, in several surveys of hospitals, examining defects in the working conditions of nurses. On the basis of this and related experience she was chosen, in 1854, to head up a party of nurses who would work in the hospital in Scutari, nursing wounded soldiers from the newly declared Crimean war. Her energy and enthusiasm for her task, the publicity which the *Times* gave to her work, the high regard in which she was held by the soldiers, and a national appeal for a Nightingale fund that would be used to help establish training for nurses, all contributed to make Florence a heroine. There was a huge drop in mortality, from 43% of the patients three months after she arrived in Scutari to 2% fourteen months later, that biographers have often attributed to her work.

Upon her return to England Florence became involved in a series of investigations that sought to establish the reason for the huge death rate during the first winter of the war in the Crimea. Theories on the immediate cause abounded; was it inadequate food, overwork, lack of shelter, or bad hygiene? In preparation for a report for a promised Royal Commission, she worked over the relevant data with Dr William Farr, who had the title "Superintendent of the Statistical Department in the Registrar-General's Office." Farr's analysis persuaded her that the worst effects had been in Scutari, where overcrowding had added to the effect of poor sanitation. Sewers had been blocked, and the surroundings of the camp had been fouled with corpses and excrement, matters that were fixed before the following winter. The major problem had been specific to Scutari. Though Florence did not have this information while she was in the Crimea, she could easily have obtained it and used it to good effect. This experience would surely have pressed on her attention the importance of checking what the data say.

Small (1998) suggests that the realization of her failure to correctly diagnose the problems at Scutari may have contributed, a year after her return to England, to her nervous breakdown. Whether or not this is correct, she emerged from this personal crisis with views that were often remarkably different from those that she had held earlier.

Although Florence Nightingale has been an inspirational figure for generations of nurses, her interest in nursing was, after her return from Crimea, subordinate to other interests. Her *Notes on Nursing* are not intended "as a manual to teach nurses to nurse" (Nightingale 1859b), but are "meant simply to give hints for thought to women who have personal charge of the health of others." She worked relentlessly for reform, in the army, in the hospitals, and in public health. She was meticulous in researching the reforms that she proposed. Where data were unavailable or inadequate, she pressed for their collection. Data adequacies are strong themes in her *Notes on*

Hospitals and in her *Introductory Notes on Lying-In Institutions*, i.e., on maternity institutions. She made strong, consistent and carefully argued cases for enlightened and data-based decision-making in the public arena.

This is not to say that Florence was always correct in her judgements. Based on her experience in the Crimea from 1854 - 1856, and unaware of the devastating health effects that would have resulted from keeping windows in Indian buildings open in the heat of the day, she advised the Indian Government (Woodham-Smith, 1952, p. 372) that the windows of barracks and hospitals should be kept open.

Florence relied on such statistical evidence as she could obtain to convince those in power of the necessity of her proposed reforms. She argued strongly that only by collecting and analysing pertinent data was it possible to determine the extent to which hospitals and other public institutions were effective in serving those who relied on their help. The knowledge thus gained must then be the basis for effective action. These same motivations are the basis for evidence-based approaches in medicine, in public health and in nursing.

On her death in 1910, Florence Nightingale left a vast collection of reports, letters, notes and other written material. These reveal Florence's considered judgements on a wide range of issues, from the construction of barracks in India through the registration of nurses in England to the character of God. Here, we construct a dramatic dialogue around quotes from Florence that bear upon the collection and use of statistical evidence in the context of maternity hospitals. We offer our dialogue as a useful and memorable way to draw the attention of students of both statistics and health sciences to the key role of data-based evidence in medicine and in the conduct of public affairs.

THE DIALOGUE

We present an imaginary dialogue between ourselves (I = Interviewer) and Florence (FN), imagining that she has travelled in time to meet us. Words taken from Florence's own writings are in italics. Where necessary, we have changed the tense, from *is* to *was*, etc.

I: Today our guest is Miss Nightingale (1820 – 1910), who has published widely on topics ranging from the health, efficiency and hospital administration of the British Army to organising an institution for training midwives and midwifery nurses. Miss Nightingale, thankyou for taking the trouble to "time travel" and join us.

FN: Thank you for inviting me. It is a pleasure to talk with you about subjects about which I feel passionately.

I: I'll start by asking about your *Introductory Notes on Lying-in Institutions*. What were your goals in publishing this book?

FN: *In the year 1862 the Committee of the Nightingale Fund … entered into an arrangement with … King's College Hospital … for the reception of midwifery cases. Every precaution had apparently been taken to render the Midwifery Department perfectly safe; and it was not until the school had been upwards of five years in existence that the attention of the Nightingale Committee was drawn to the fact that … during the period of nearly six years that the wards were in use, 780 women had been delivered … and that out of this number twenty-six had died – a mortality of 33.3 per 1000. Since that event we have been anxiously enquiring whether it would be justifiable to re-open our Midwifery Training School under other conditions.*

I: What did you do next?

FN: *The first step to be taken in the discussion was to enquire, what is the real normal death-rate of lying-in women?*

I: That should be have been fairly straightforward to ascertain!

FN: *It must be admitted … that midwifery statistics are in an unsatisfactory condition. … There appears to be no uniform system of record of deaths, or of the causes of deaths, in many institutions, and no common agreement as to the period after delivery within which deaths should be counted as due to the puerperal condition. Similar defects are obvious enough in the records of home deliveries; and hence it follows that the mass of statistics which have been accumulated regarding home and hospital deliveries, admit of comparison only in one element, namely, the total deaths to total deliveries, and this only approximately.*

I: You know, your present-day colleagues Rona Campbell and Alison McFarlane come to a similar conclusion – they write that *with computing power … beyond your wildest dreams, so little has been achieved.*

FN: What a disappointment that is to my ears! *There were in England during the year 1867 768,349 births, and … 3,933 women died in childbed. This gives an approximate total mortality of 5.1 per 1,000 from all causes.* Have matters really not improved at all?

I: Well yes they have, in one sense. Thankfully the rate of maternal deaths in England is now *too low to form a basis for statistical comparisons.* So *as maternal deaths became fewer, studies tended to focus on mortality in babies.* For instance, in 1991 there were 702,471 births in England and Wales, and 5,618 perinatal deaths, giving a perinatal mortality rate of 8.0 per 1,000. In the same year 1.1 per cent of births took place at home.

FN: *I looked to the abolition of all hospitals and workhouse infirmaries*, and at the time, 1867 it was, I said *it was no use to talk about the year 2000.*

I: Indeed, Campbell and Macfarlane concluded in 1994 that *there is no evidence to support the claim that the safest policy is for all women to give birth in hospital.* What did your evidence point to in the end?

FN: Ah, evidence! Evidence is the most important tool we have for decision-making. *We …do not consider the human mind capable of receiving what, strictly speaking, can be called proof. Evidence, which we have means to strengthen for or against a proposition, is our proper means for attaining truth.*

I: That can't always be easy! Can I ask you at this point, did you ever strike any difficulties with the evidence you had to hand?

FN: *So may times our information regarding the questions at issue was by no means as full as we could wish – indeed it was almost nothing. Our only resource was to deal with such statistical information as we possessed, and to ascertain fairly what it told us.*

I: So let's return to the original question. What did the evidence point to? How would you summarise the results of your research?

FN: *The entire result of this enquiry may be summed up, in a very few words, as follows:- A woman in ordinary health, and subject to the ordinary social conditions of her station, will not, if delivered at home, be exposed to any special disadvantages likely to diminish materially her chance of recovery.*

I: What factors seemed to contribute to maternal deaths in English hospitals?

FN: *Dr. Le Fort has examined the influence exercised by … the size of hospitals on the mortality after childbirth. We must protest against massing hospitals, alike only in one circumstance, together for the sake of taking their statistics in bulk …, except for the most general purposes.* As for time spent, *there appear to be no extant statistics to show the relation of the death-rate to the period of residence…. In these most important points of enquiry, the very elements are yet wanting to us.* Also it is necessary to control for various *secondary influences … which must affect to a certain extent the results of comparison of death-rates among different groups of lying-in cases. Such are the general sanitary state of … rooms where deliveries take place; the management adopted; the classes of patients; their state of health and stamina before delivery; the time they are kept in the midwifery wards before and after delivery. These elements are directly connected with* the issue of death-rates, *and yet our information regarding them is by no means as full as we would wish.*

I: Is there any evidence of data manipulation, for example by refusing to treat seriously ill patients?

FN: My notes show that the reverse situation has occurred. *Some hospitals have rather plumed themselves on their humanity by giving shelter to poor lying-in women as long as possible, while in military lying-in hospitals soldiers' wives are obliged to go home as soon as they can, to help the domestic earnings. In the first class the death-rate is high; in the last it is low.*

I: Finally, what aspects of the research could be improved?

FN: *My enquiry revealed very quickly to me that great improvements are required in the manner of keeping midwifery statistics, and that many data are wanting for this purpose …. A*

death in childbed is almost a subject for an inquest. It is nothing short of a calamity which it is right that we should all know about, to avoid it in future.

I: So it appears that while some issues, such as overall maternal death-rates, have improved, some issues, even some as basic as appropriate data collection, have not improved at all! Thank you Miss Nightingale for your insights. We appreciate the contribution you can continue to make to raise awareness of the issues here.

FN: *Too kind, too kind.*

EDUCATIONAL IDEAS

Dialogue as an educational tool has a history almost as old as education itself. The Greek philosopher and teacher Socrates (470 – 399 BC) questioned his students. An example of the exchanges appears in Cole (1950). Solomon and Higgins (1997) remind us that although Socrates himself wrote none of these conversations down, Plato (427 – 347) recorded extensive dialogues between Socrates and other philosophers of Socrates' time.

Our dialogue has already been used as set reading by Biostatistics students, including pre-medicine students, in a biology major at Loyola College in Maryland (Elizabeth Walters, personal communication). It can help de-mystify the notions of evidence-based nursing and show its historical continuity with concerns that were important to the founder of modern nursing, Florence Nightingale. Decker and Farley (1991) used an exchange of letters with Florence to achieve the broader aim of assuring nurses of the continuing importance of Florence's opinions on such topics as training, observation and testing of nursing students. We have found anecdotally that students welcome contact with the history of the subject they are studying. Future work could focus on obtaining empirical evidence for the usefulness of the interview as an educational device.

Similar dialogues could be constructed, where relevant documentation has survived, between other statisticians to highlight other important moments in statistical history, or to demonstrate the opinions of statisticians of the past on important topics. Additionally, there is a large amount of interesting material in Florence's writings that could be used to extend our dialogue. Florence Nightingale confined herself to her bed for much of her life, and became deaf in her old age. Her prime means of communication was the written word, which helps explain the extent of her writing.

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