

Rising to the challenge: Florence Nightingale (1820-1910)

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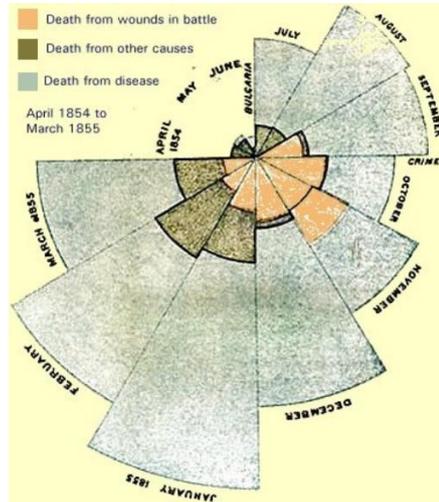


Illustration 35.

Nightingale F.
"Notes on Matters
Affecting the Health,
Efficiency, and Hospital
Administration of the
British Army Founded
Chiefly on the Late
Experience of the Late
War."

Presented by Request to
the Secretary of State
for War.

Privately printed for
Miss Nightingale.
Harrison and Sons.
1858.

Many of the greatest achievements of humanity have engaged the help of numbers. This makes the celebration of the birth of Florence Nightingale, born 200 years ago on 12th May 2020, particularly relevant today. She is remembered for bringing discipline and care to nursing, but she was also an accomplished statistician. By carefully collecting evidence she took personal and political action to minimise deaths in military hospitals during the Crimean War. Her skilled use of data and coloured diagrams gained public and political attention for the conditions she found there. These methods of explaining facts were quite revolutionary in her time but are regularly used now as society strives for acceptance of policies to contain the new virus.

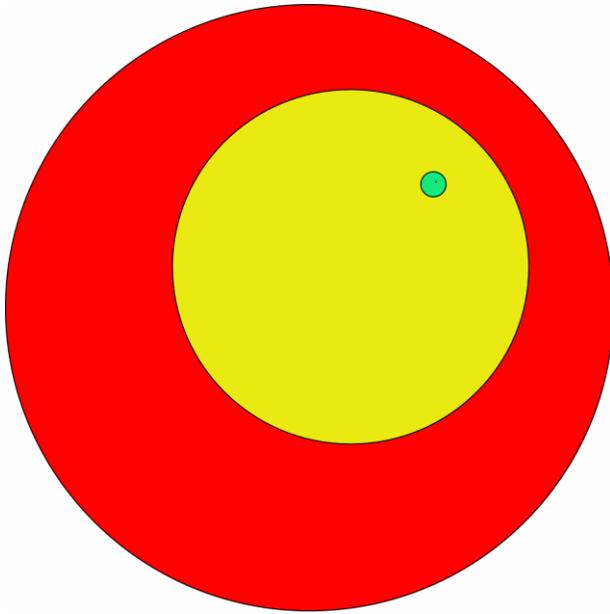
Today, it is COVID-19 and the need for isolation and the suspension of normal economic life. In the hospital at Scutari in Florence Nightingale's time, it was septicaemia and the need for nursing and proper hygiene. Then, there was no cure for such infection, just as today, there is no vaccine for the virus. In both, the need is for respect for numbers and social discipline moderated by personal care.

Viruses and bacteria evolve. Their battle with human life, biology against biology, is ever present and intrinsically unpredictable. New viruses and anti-bacterial resistance will present themselves in the future, and old ones return. In a similar way life-on-life confrontations with other human regimes will also recur, sometimes leading to conflict.

However, threats from the agents of physical science are different. They do not evolve and so are more predictable. Fire is unusual for being "infectious" and catching. But most other agents, like thunder and lightning, are not. The more you learn about them the less alarming they become.

Education can act like a vaccine, providing confidence and immunity from fear, though needing an occasional booster. Although some powerful threats can be handled in this way, others appear more dangerous the more the evidence is understood. In particular, James Lovelock has written of the future threats from climate change and nuclear energy, that those who know most about climate change are the most concerned, whereas those who know most about nuclear energy are the least worried.

An understanding of the basic science shows why replacing fossil fuels with nuclear power as the main source of energy is the surest way to mitigate climate change.ⁱ However, any mention of the words *nuclear* or *radiation* strikes alarm in modern society. How might Florence Nightingale have portrayed the evidence to reassure today's society and its politicians?



Marie Curie, pioneer in nuclear science and medicine, knew no such fear. Thanks to her work, nuclear radiation is used today both to diagnose and to treat cancer. Nevertheless, since the Cold War many have seen radiation as a significant cause of cancer. At normal doses there is no scientific evidence for this.ⁱⁱ The effect of radiation on life is the same as it was a thousand million years ago, and life has had plenty of time to find ways to recover from the small amount of damage a radiation dose causes.

Florence Nightingale might have explained this with a simple coloured diagram to illustrate the numbers, like she did for the benefits of hygiene and nursing over 160 years ago. In this diagram

the area of each circle shows the size of a radiation dose received in a month. The big red circle is the treatment dose given to a tumour in radiotherapy to kill its cells. The yellow circle is the dose received by nearby healthy tissue in the same treatment. Its cells usually survive but just occasionally suffer a secondary cancer. The green circle is a monthly dose that never leaves any lasting damage, either in humans or in animals. The tiny black dot in the green circle, a factor a thousand times smaller, is the super-cautious maximum monthly public dose allowed by the regulations. These could be relaxed a thousand times with no health consequences.ⁱⁱⁱ Medical treatments would be simpler, and nuclear power – the reliable replacement for fossil fuels – would be two or three times cheaper. If Florence Nightingale were able to reassure the public this way, the threat of climate change could be mitigated, and that would be best for nature, too. Our task is to emulate her.

9th May, 2020

ⁱ More discussion in a lecture on YouTube <https://www.youtube.com/watch?v=qymncyTbB-4> and an article https://www.researchgate.net/publication/339629356_Nature_Energy_and_Society_A_scientific_study_of_the_options_facing_civilisation_today

ⁱⁱ A recent review <https://journals.sagepub.com/doi/full/10.1177/1559325820921641>

ⁱⁱⁱ The remit of many authorities in health, the environment and energy is to *protect* people from radiation. People in those jobs are reluctant to face the scientific truth. As Upton Sinclair wrote *It is difficult to get a man to understand something when his salary depends on his not understanding it.*