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A History Lesson On The Dangers Of Letting Data Speak For Itself

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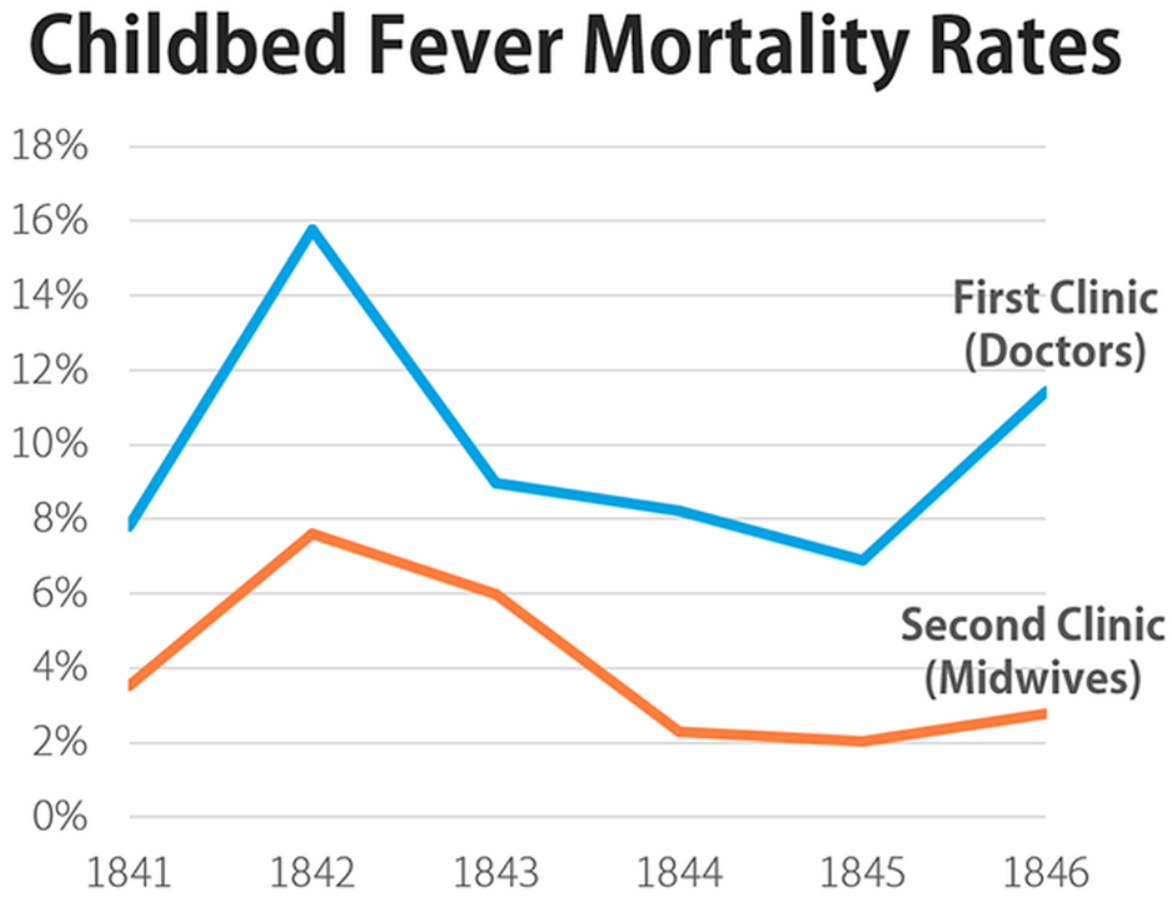
10-12 minutes

What happens when the data shows you need to change a current approach or business practice? Any kind of change can be very hard—even with supporting data. If you're at a large company, it can be very difficult to get executives and teams to re-examine previously successful practices and adopt new ones. Even agile startups are no less immune to "staying the course" when a potential new direction conflicts with the founders or investors' opinions and beliefs.

If data is becoming more and more critical to our business success, why do we still struggle to listen to it on a regular basis? Embracing data has been a problem for humanity long before the appearance of databases, spreadsheets, and dashboards. Irish playwright George Bernard Shaw once wrote, "All great truths begin as blasphemies." While we may aspire to rely more on data in our decision-making, human nature can get in the way as we resist new ideas or insights.

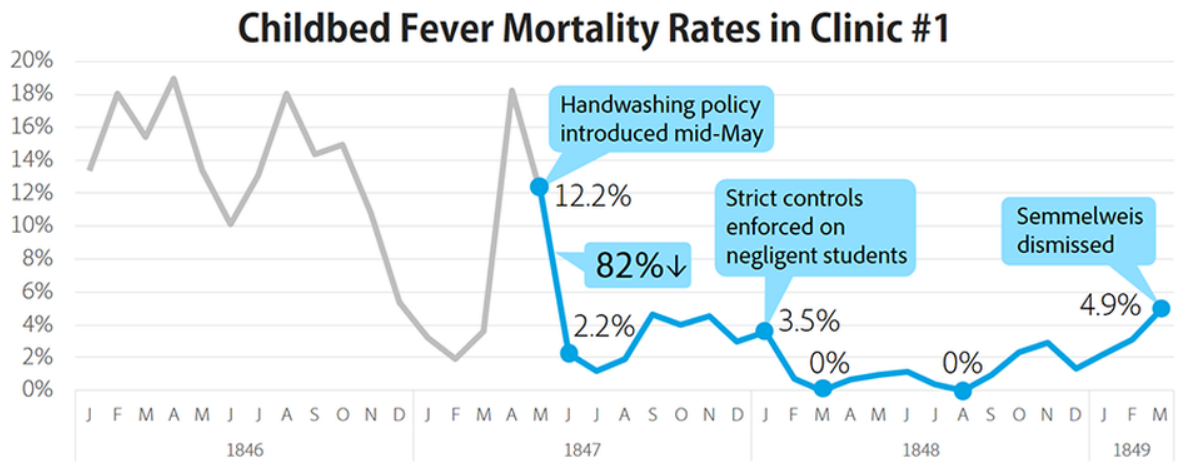
One illustrative example involves a Hungarian doctor from the mid-nineteenth century named Ignaz Semmelweis (1818-1865). In 1846, he was appointed as an assistant at a Vienna hospital with two maternity clinics for training doctors and midwives. Similar to other hospitals around the world at this time, many admitted mothers were dying of a mysterious illness called puerperal or childbed fever. Semmelweis discovered a disturbing trend where its doctors' clinic had an average mortality rate of 9.9%, which was significantly higher than that of its midwives' clinic (3.9%).



Semmelweis was determined to identify the cause of this noticeable difference between the two clinics. At the time, there was no notion of germs or infections so he considered a variety of potential causes such as bad ventilation, overcrowding, delivery methods, and even religion. An unfortunate event triggered Semmelweis's aha moment. When a close friend at the hospital was conducting an autopsy, he was accidentally poked by a student's scalpel and later died from the wound. As Semmelweis performed the difficult post-mortem examination, he noticed a strong similarity in the pathology of his friend's illness and that of the women who died of childbed fever.

At the Vienna hospital, it was common for the doctors to perform autopsies in the morning and then spend the rest of their day attending patients in the maternity ward—without ever washing their hands. Unlike the doctors, the midwives performed no autopsy work and were not in contact with any corpses. Semmelweis hypothesized that some kind of poisonous particles were being transferred by the doctors from the cadavers to the patients in the maternity clinic. He found a chlorinated lime solution was strong enough to remove the putrid smell of the autopsy tissue from the doctors' hands and determined it would be ideal for removing these deadly contaminants.

Two months after the death of his friend, he introduced a new handwashing policy for the doctors to use the chlorinated lime solution after any autopsies. When he launched the new policy, the monthly mortality rate was 12.2% in the doctors' clinic. Semmelweis's new policy had an immediate impact, and the death rate was lowered to 2.2% (an 82% decrease). After several months of significantly lower mortality rates, he still observed student doctors who were not following the policy. After introducing stricter controls on the negligent doctors, Semmelweis was able to lower the mortality rate even further with two months where no mothers died of childbed fever.



Semmelweis couldn't scientifically prove why his handwashing policy worked—that wouldn't happen until chemist Louis Pasteur discovered the germ theory of disease in the mid-1860s. What the doctor had was more than 18 months of statistical data showing his handwashing approach worked and that such practices could save the lives of thousands of expectant mothers. He had the truth—but was it enough?

Rather than lauding Semmelweis's valuable discovery and adopting his methods throughout the world, he faced sharp criticism, ridicule and resistance from the established medical community. As an example of the prevailing sentiment of many mid-nineteenth-century doctors, American obstetrician Charles Meigs is attributed with saying, "Doctors are gentlemen and a gentleman's hands are clean." Due to their social status, physicians were unaccustomed to being reproached—especially by one of their own. Semmelweis's medical peers couldn't accept they were the primary cause of the childbed fever deaths and that women's lives could be saved simply through better hygiene.

Voltaire once said, "It is dangerous to be right in matters on which the established authorities are wrong." Semmelweis paid dearly for his "heretical" handwashing ideas. In 1849, he was unable to renew his position in the maternity ward and was blocked from obtaining similar positions in Vienna. A frustrated and demoralized Semmelweis moved back to Budapest. He watched his theory be openly attacked in medical lecture halls and medical publications throughout Europe. He wrote increasingly angry letters to prominent European obstetricians denouncing them as irresponsible murderers and ignoramuses. The rejection of his lifesaving insights affected him so greatly that he eventually had some kind of mental breakdown, and he was committed to a mental institution in 1865. Two weeks later he was dead at the age of 47—succumbing to an infected wound inflicted by the asylum's guards.

What can we learn from Semmelweis's experience?

Semmelweis's data met three key criteria—it was *truthful*, *valuable* and *actionable*—but he ultimately failed to see his ideas adopted in his lifetime. The Hungarian physician stumbled in one essential area—the communication of his data. I've identified four oversights that may have prevented Semmelweis from communicating his ideas more effectively.

1. Timeliness and Clarity

Semmelweis took 14 years to officially publish his childbed fever findings in 1861 (The Etiology, Concept, and Prophylaxis of Childbed Fever). Up until this time, his work was shared within the medical community by his colleagues and students. Unfortunately, these associates often misinterpreted and misrepresented Semmelweis's claims, causing many obstetricians to dismiss, refute or ignore them.

Key takeaway: *If you possess insights that are critical to your business success, you have a duty to communicate them clearly in a timely manner. Semmelweis waited too long and allowed others to inadvertently cloud his message.*

2. Audience and the Curse of Knowledge

Semmelweis may have fell victim to a common ailment that occurs in people who become enlightened by data—the curse of knowledge. He forgot what it was like to *not know* what he knew. Semmelweis couldn't grasp why the medical community wouldn't accept his simple handwashing advice. Rather than trying to foster understanding and build common ground with his audience, he grew impatient and threw insults at his critics—further alienating himself from the people he was trying to influence.

Key takeaway: *Know your audience and strive to understand their existing attitudes and beliefs. Not everyone is going to accept your data, especially if it is disruptive to commonly held practices or beliefs. Instead, you may want to focus on identifying open-minded allies who can help build internal support and consensus for your ideas.*

3. Narrative Evokes Emotion

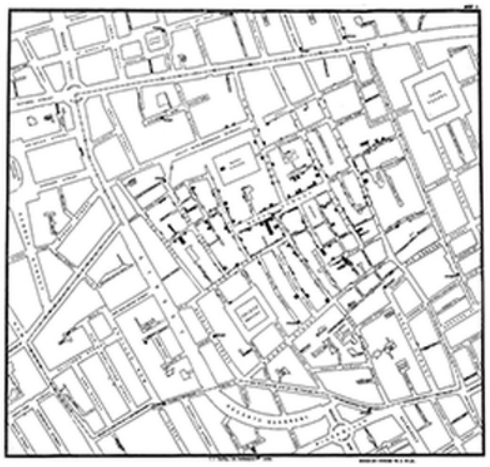
One of the biggest mistakes Semmelweis made was he failed to tell a story with his data. Interesting statistics alone won't persuade skeptical minds. The data-driven doctor missed an opportunity to weave his facts into a compelling data story that connected with his audience on an emotional level.

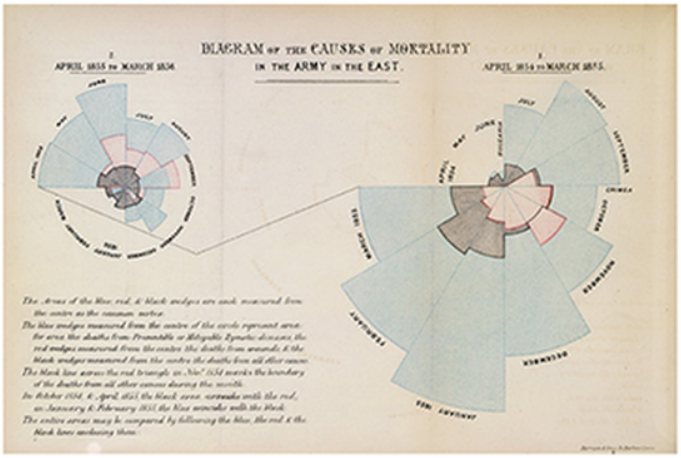
Imagine if he was able to have his fellow obstetricians think of their own mothers and the critical role they played in their lives. What if he humanized his cold numbers? For example, if his doctors' clinic had the same mortality rate as the midwives' clinic (3.9%, not 9.9%), his hospital could have preserved the lives of more than 1,200 women (!) between 1841-1846. In addition, the lives of countless newborns, older siblings, and husbands wouldn't have been adversely impacted by the loss of these women.

Key takeaway: *Don't rely on just logic and reason to make your points. Decisions are more often made by emotion, and an effective narrative can touch your audience in ways the numbers alone never will.*

4. The Power of Data Visualization

Finally, Semmelweis failed to visualize his numbers effectively as he relied primarily on data tables. Well-designed charts can make insights come to life that would otherwise lie dormant and hidden in the rows and columns of tables. It's true Semmelweis didn't have access to visualization tools like we do today, but that didn't stop another physician John Snow in 1854 from creating a map visualization to effectively illustrate a cholera outbreak in London that centered around an infected water pump. Similarly, another famous medical caregiver and statistician, Florence Nightingale, also used charts in 1858 to raise awareness of how unsanitary conditions were killing injured British soldiers during the Crimean War.





Images from Wikipedia and Understandinguncertainty.org

Key takeaway: *Data can often be communicated more powerfully with data visualizations than just tabular data. Charts should reinforce your key points and make it easier for your audience to follow your data story.*

In the case of Ignaz Semmelweis, it can be easy to criticize mistakes that were made more than 150 years ago. We lose context for the political struggles that were happening in Vienna and the professional egos that he was facing in Europe at the time. No one can question his passion or determination to help expectant mothers, which earned him the revered title of "Savior of Mothers." If you only take one insight from Semmelweis's struggle it's that in order to influence change through data, it is essential that we communicate insights effectively. In subsequent articles, I'll discuss how data storytelling can help with this important task.

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