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Reflections on pandemics, past and present

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The author reflects on her personal experiences during the 2009 H1N1 influenza, acquired immune deficiency syndrome (AIDS), and severe acute respiratory syndrome (SARS) pandemics. The roles played by the Centers for Disease Control and Prevention related to pregnancy-associated influenza during the 2009 pandemic are described. Risk communication principles are summarized and resources provided.

Key words: history, influenza, pandemic, pregnancy

Pandemics are personal. The emergence of a new disease that spreads easily between people and jumps from region to region has an objective narrative, but each of us experiences our own private outbreak. Many people working in public health and clinical medicine know where they were when the 2009 H1N1 influenza pandemic became real to them. I was in the Emergency Operations Center of the Centers for Disease Control and Prevention (CDC).

Emergence of the pandemic

As Chief Health Officer in CDC's 2009 pandemic influenza response, I was a scientific spokesperson for the agency. By late April, I had already done press briefings and several individual interviews, where I shared what little information we had at the time, and tried to place that

in context. One evening, after successfully finishing what was expected to be a very difficult live television interview, I was feeling much relief and delight. I returned to our crowded emergency operations center to reconnect with my colleagues. I found them huddled around a speaker phone, looking ashen. They had just conferred with a state's public health officials about a pregnant woman who was critically ill with what was likely to be the new virus. She was not expected to make it. The 2009 H1N1 virus was not a practice exercise. Real people were going to get very ill and people who were not supposed to die that year were going to—even if we all did everything we could, even if all the parts of the public health and health care delivery systems rose to the occasion, and even if we had much good fortune. That is what a new influenza virus does. At this point, we could not say how large the problem would get or how many lives were threatened. But we knew that for this woman, and her family and caregivers, the reality was overwhelming.

Women and childbirth

What is it about women dying in childbirth? Each of us was once a newborn completely dependent on our mother—that is, if she survived our delivery. The 2009 pandemic reminded me that mothers dying in childbirth used to be commonplace in the United States—and how lucky we are that times have changed. It also reminded me that a woman dying in childbirth is still far too common in many places around the world.

I had personally been intrigued by childbirth since my grandmother first

told me her family's story. She was born in 1893—that seemed exotic even in the 1960s and 1970s when I was growing up. I used to pepper her with questions about all the changes in the world she had witnessed. *Greatest development of modern life?* The ice cube. *Memories about prohibition?* The town tippler asleep on the doorstep of the family's general store, after overdoing it with a case of lemon extract. *How did anesthesia work when you had your babies?* That one required a long story.

I knew that my father was born at home, upstairs over the West Virginia general store my grandparents ran. A few years earlier, my grandparents had been living in Baltimore, MD, and things had been different for my grandmother's first delivery. She described being in the hospital when a nurse told her "Don't worry, we won't let what happened to your sister happen to you." My grandmother had not been told yet, but her beloved sister Bessie, who lived in another state down south, had recently died during childbirth. There had been some sort of collusion to keep that information from her, but the nurse had not been in on the full plan. My grandmother said on hearing the nurse's words, she immediately realized what must have happened, and she fainted. When she came to, her own healthy baby girl was there. They named their daughter Betsy, in memory of the aunt she would never meet. And Grandma said for each of her next 3 deliveries, she just passed out—reliving the shock she had experienced at learning of her sister's death, and miraculously being spared the pains of childbirth.

This family story was important to me. While I occasionally suspected someone had slipped my grandmother some ether, I generally took her words at face value. I was grateful to live in a time and place where women did not die in their twenties like my great aunt Bessie had. I was grateful times had changed from when medical problems were kept secret by family members or clinicians, from

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when pregnant women had to be protected from information their caregivers thought they could not handle. I was grateful I did not have to leave school at eighth grade to go to work, like my grandmother had, and instead had the chance to become a doctor or anything else I wanted to be.

My first pandemic: AIDS

The month I began medical school, my grandmother died. I could no longer interrogate her as I learned about modern medical practices. But I soon became close to her daughter—the same aunt Betsy who had been named for Grandma's sister Bessie. Betsy and my uncle Jerry lived down the street from the New York City hospitals where I did internal medicine training. They fed me regularly and provided a sounding board as I recounted the dramas of internship and residency—stories of the torrent of terribly ill people whose care was being entrusted to me. Many of them were dying from a newly recognized disease—acquired immune deficiency syndrome (AIDS). We did not call it a pandemic then—but it was definitely personal.

I was a 25-year-old intern. How could I not be overwhelmed watching the deaths of so many young people? In those days, we struggled with the very private information behind each patient's diagnosis, and tried to figure out how to explain events to our patients' families when they were too sick to do so themselves.

Health care workers in a pandemic: SARS

My aunt Betsy died in 2003, while I was in Beijing, China, investigating the epidemic of severe acute respiratory syndrome (SARS) there. I got news of her passing a few days later, and was unable to get to her funeral or grieve together with our family. Instead, I was immersed in the public health emergency in China, where the SARS pandemic was centered. My public health counterparts in Beijing had the difficult task of triaging the scarce intensive care unit beds spread across the city. They had convened each evening to sort out who was about to die, how many more beds would thus open

up, and which patients would get them. There were doctors, nurses, and medical professors in some of those intensive care unit beds. My counterparts had to manage the epidemic while some of their longtime colleagues and friends were dying from it. The Chinese professionals rose to the occasion—the government built a new 1000-bed facility in record time—but you knew that this pandemic was personal for them.

After I got back home that summer, I went to visit my uncle Jerry. We reminisced about my aunt and the many great years they had together. She had fought to stay out of the hospital while her cancer worsened. She had always been suspicious about diseases being spread in hospital settings. SARS was the poster child for that problem during its emergence in cities from Hong Kong to Toronto. Good infection control, isolation, and quarantine had eventually interrupted the virus' spread. Betsy was born in a hospital, but died as she had wanted, at home.

2009 H1N1 pandemic influenza and pregnancy

During the 2009 H1N1 pandemic, CDC's workforce rallied. People from across the agency united to support whatever was needed. Our obstetric and neonatal care experts from diverse programs converged to address the evolving issues of H1N1 influenza in pregnancy. They served in many roles: conducting clinical investigations; developing guidance for diagnosing and treating new cases; establishing systems to identify and report severe illness; and designing education materials and resources to assist pregnant women and obstetrician-gynecologists. They organized the gathering of new knowledge, such as the articles that appear in this special issue of the *American Journal of Obstetrics and Gynecology*. And they supported clinicians around the country, who were themselves on the real front lines—some of them caring for women who were very ill, and others busy clarifying the concerns of healthy pregnant patients who sought out advice from their most trusted authority—their own obstetrician-gynecologists.

Because the risk of serious influenza-related complications is higher among pregnant women compared with that of the general population, for years we have recommended flu vaccine for pregnant women. Unfortunately, too few pregnant women have been getting flu vaccinations. This was a time to change the dynamic. The prominence of pregnant women among H1N1 influenza-associated hospitalizations and deaths—during the spring wave of the 2009 experience was striking. This kind of thing was not *supposed* to happen during pregnancy—at least not in this era.

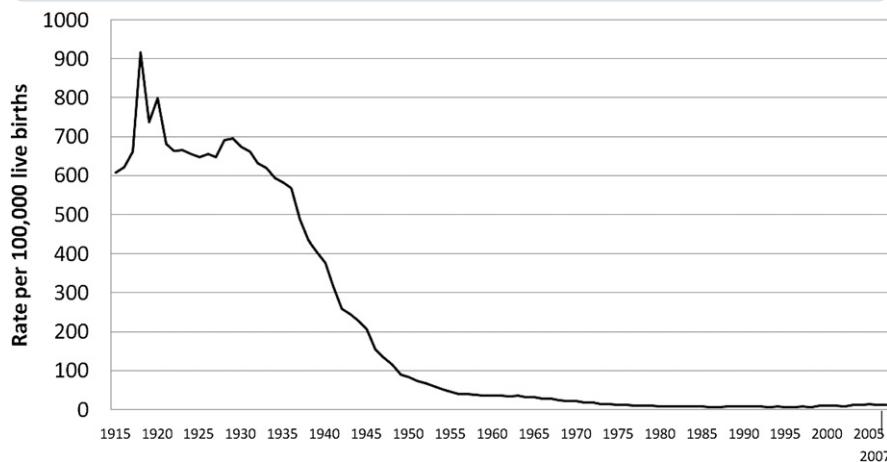
We realized that early antiviral treatment could make a difference in H1N1 influenza patients, but pregnant women and many of their clinicians were also reluctant to use these medications. We realized that rapid diagnostic test results were unreliable, and some women were not being treated because such tests were falsely negative. We realized that there were decades of medical practice, as well as cultural and behavioral norms, that were barriers to the efforts aimed at preventing influenza complications in pregnancy. Scientific investigations bore out the value of antiviral treatment, but science was not going to be enough. Effective communication was critically needed.

Risk communication

The principles of risk communication underpinned our media and communication strategies.^{1,2} Communicating in the face of much uncertainty requires different strategies. It also turns out that people do not generally panic when they hear bad news. They may not even process the news at all—but there are some ways that you can communicate risks that have a better chance of getting through when a listener is very concerned. Key components of risk communication are expressing empathy, acknowledging uncertainty, and being honest and transparent. How different it was in my grandmother's day, when withholding of information and promising perfect outcomes were the norm.

For me as a spokesperson, it was easy to express empathy during interviews. Each of the severe illnesses in pregnant women was jarring. It was easy to imag-

FIGURE
Maternal mortality (deaths/100,000 live births)
in United States, 1915 through 2007



Data are for death registration area for 1915 through 1932 and for United States for 1933 through 2007. Data are coded according to relevant *International Classification of Disease* revision over time period. Source: Centers for Disease Control and Prevention/National Center for Health Statistics, National Vital Statistics System, Mortality.

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ine the families behind each woman. And the media explored some of these stories in depth, so you did not even have to use too much imagination. It was easy to acknowledge uncertainty, because influenza is so unpredictable that you would have to be uninformed to claim certainty about what was going to happen. And it was a privilege to be a spokesperson when honesty and transparency are the standards of public health communication.

About 6 weeks into the 2009 H1N1 emergency response, my uncle Jerry collapsed in his apartment. He'd had a bad stroke. He was 90 years old. My nephew went to visit him in the hospital. The television was on in his room, and he ap-

parently saw me up on the screen, presumably talking about flu. According to my nephew, he seemed to recognize me. I hope I was using the principles of risk communication—being open and honest, acknowledging the uncertainty ahead, and expressing my genuine empathy. I like to think that what Jerry saw on the screen was me saying goodbye.

Influenza and maternal mortality

In the early 20th century, maternal mortality was a fact of life.³ But even in those difficult years, the toll that influenza took stood out. When it came to vital statistics, countries differed on whether they recorded the cause of death among women as pregnancy or influenza, but

the major spike in the United States in 1918 is unmistakable (Figure). I first saw the data in this graph in February 2010, and again found myself feeling grateful to live in the modern era. A few months later, I read a book a colleague had sent me, William Maxwell's novel *They Came Like Swallows*. It is a story of a family's experience set during the 1918 great influenza pandemic. In the story, a pregnant mother is sent away from her young son, to protect her after her son had been exposed to the fever that was going around at the time. The pain of the separation on both the mother and child is palpable.

While I was reading this, I finally put two and two together. If my aunt Betsy died during the SARS epidemic at nearly age 85 years, what year was she born? If Grandma's sister Bessie died in childbirth earlier that year, what had she actually died from? My parents supplied the part of the family history that my grandmother had not thought to tell me. Bessie was already ill when they took her off the trolley—that was why she had been rushed to the hospital, not because of a difficult labor. It was 1918. ■

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