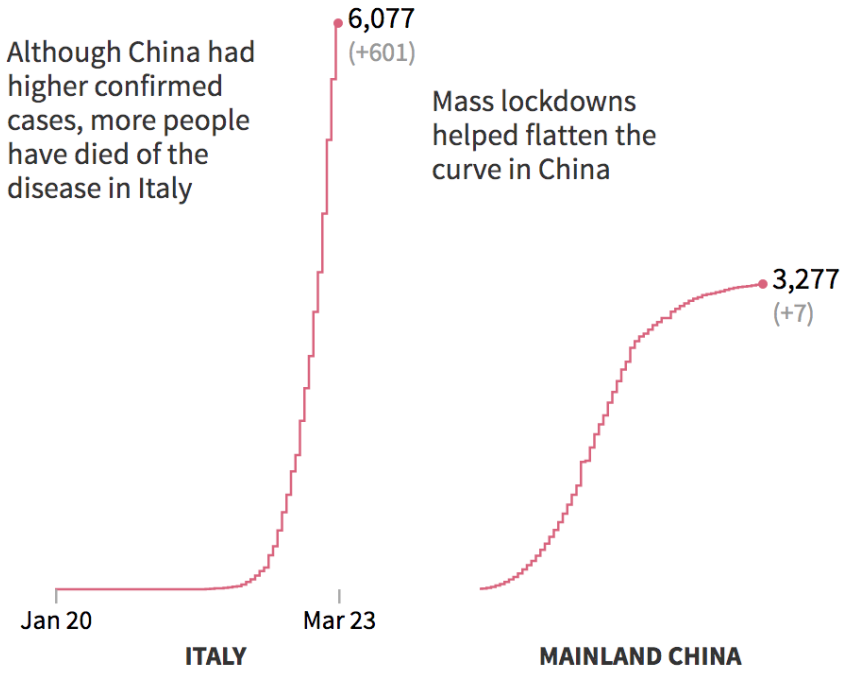
Evidence in Support of Community Interventions and Social Distancing

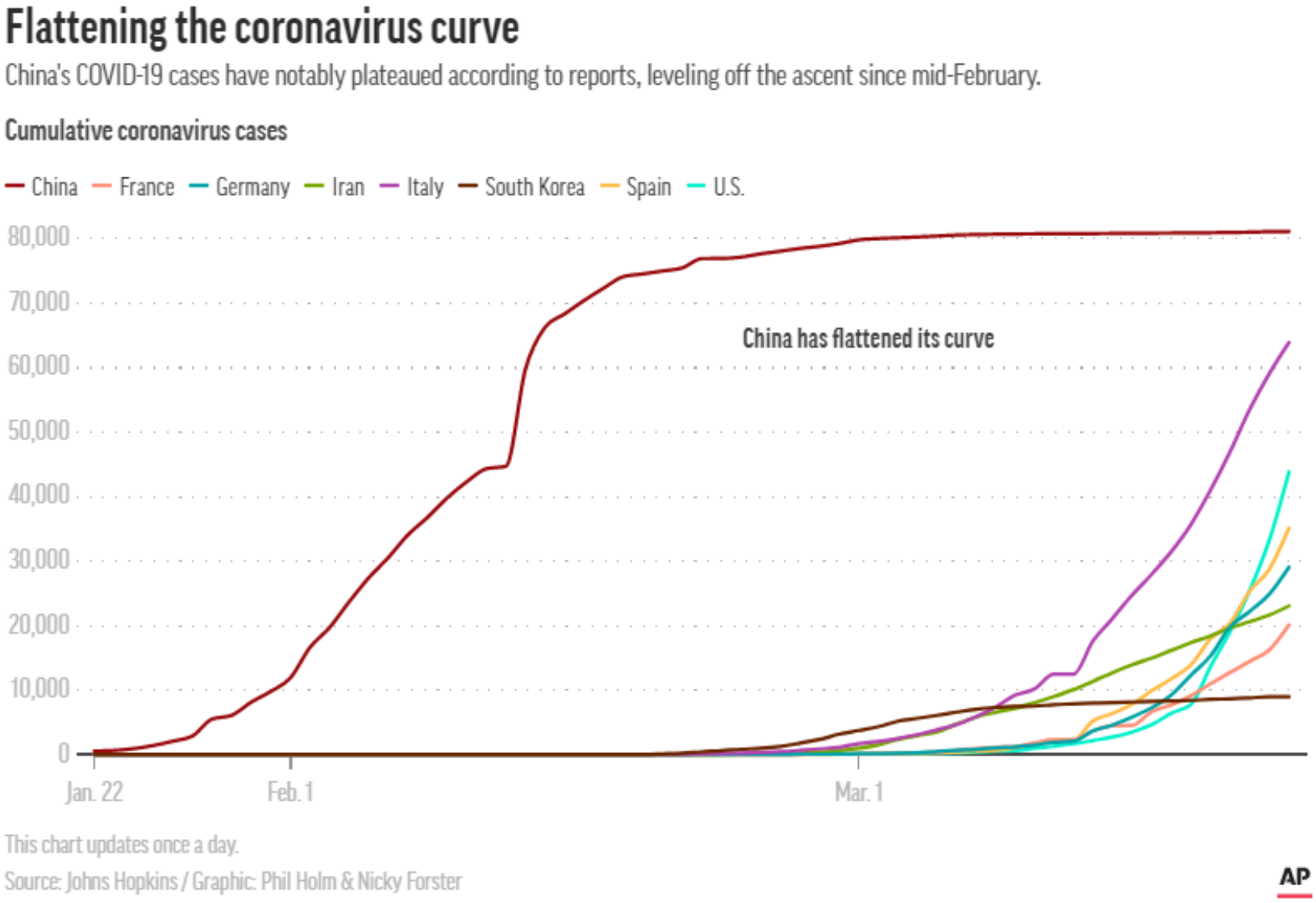
Community Interventions

Community Non-pharmaceutical Interventions (NPIs) include the enforcement of social distancing, as well as enforced restrictions on movement, business and school operations, and other social interactions, like mass gatherings. The evidence for implementing Community NPIs to slow disease transmission is well-documented. Perhaps the strongest case is made by simply observing the unfolding events around us. **The countries which fared best against the COVID-19 pandemic were those which moved swiftly to implement tight controls on personal movement. A good example is China versus Italy:**

CHINA



[Image Source: Reuters]



"Epidemiologists say China's mammoth response had one glaring flaw: **it started too late**. In the initial weeks of the outbreak in December and January, Wuhan authorities were slow to report cases of the mysterious infection, which delayed measures to contain it, says Howard Markel, a public-health researcher at the University of Michigan in Ann Arbor. "The delay of China to act is probably responsible for this world event," says Markel. A model simulation by Lai Shengjie and Andrew Tatem, emerging-disease researchers at the University of Southampton, UK, shows that **if China had implemented control measures a week earlier, it could have prevented 67% of all cases there Implementing the measures 3 weeks earlier, from the beginning of January, would have cut the number of infections to 5% of the total**.

What are the lessons?

Tatem and Lai's model assesses the combined effect of China's early detection and isolation, the resulting drop in contact between people and the country's intercity travel bans. Together, these measures prevented cases from increasing by 67-fold — otherwise, there would have been nearly 8 million cases by the end of February. **The effect of the drop in contact between people was significant on its own**. Using mobile-phone location data from Chinese Internet giant Baidu, the team found a dramatic reduction in people's movements, which they say represents a drop in person-to-person contact. Without this decrease, there would have been about 2.6 times as many people infected at the end of February, they say."

[Source: *Nature* Vol 579, 26 March 2020

ITALY

"**By February 23, the country had 123 confirmed cases and had sealed off 11 towns with checkpoints. But the early government response was ambiguous**: while officials urged the public to practice social distancing early on and closed all public schools on March 4, they also urged Italians "not to change our habits," with the mayor of Milan publicizing a "Milan doesn't stop" campaign.

As the disease spread, the government began to respond more severely. On March 8, it locked down the north of the country, where the virus was first found. On March 9, it extended the lockdown to the rest of the country.

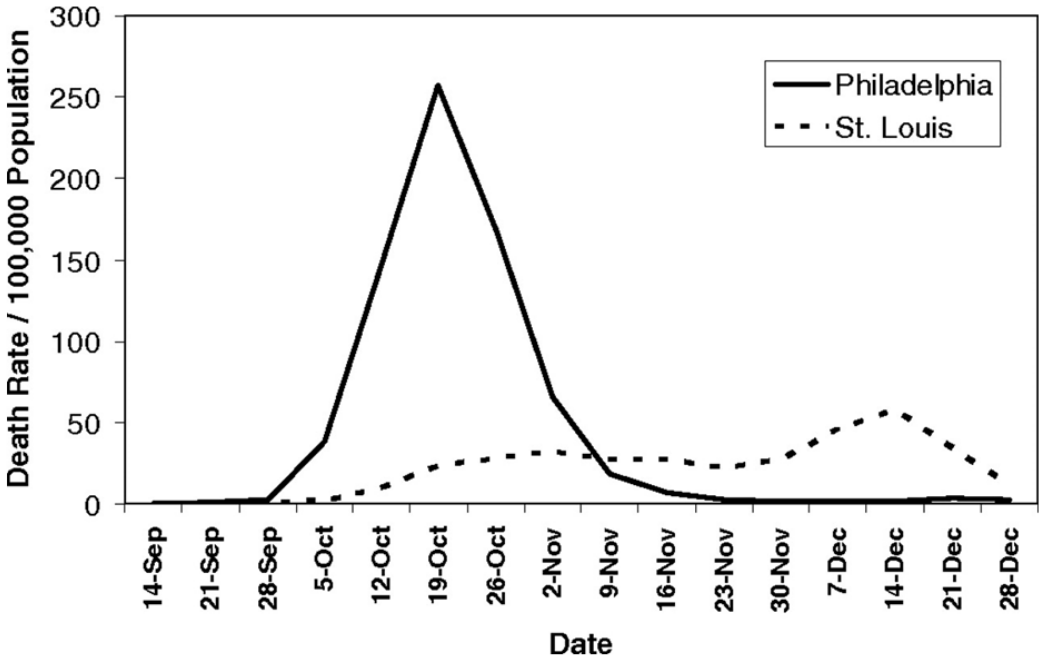
[…] the problem is not that Italy didn't respond to the coronavirus. The problem is that it always responded **slightly too late and with slightly too much moderation.**

[Source: Vox Science and Health]

Italy's delay in enforcing community NPIs has resulted in skyrocketing transmission and 10% mortality rate, with an average of around 630 deaths per day. They are now resorting to some of the most severe Health Orders in the world, which prohibit jogging and movement between residences.

1918 FLU PANDEMIC

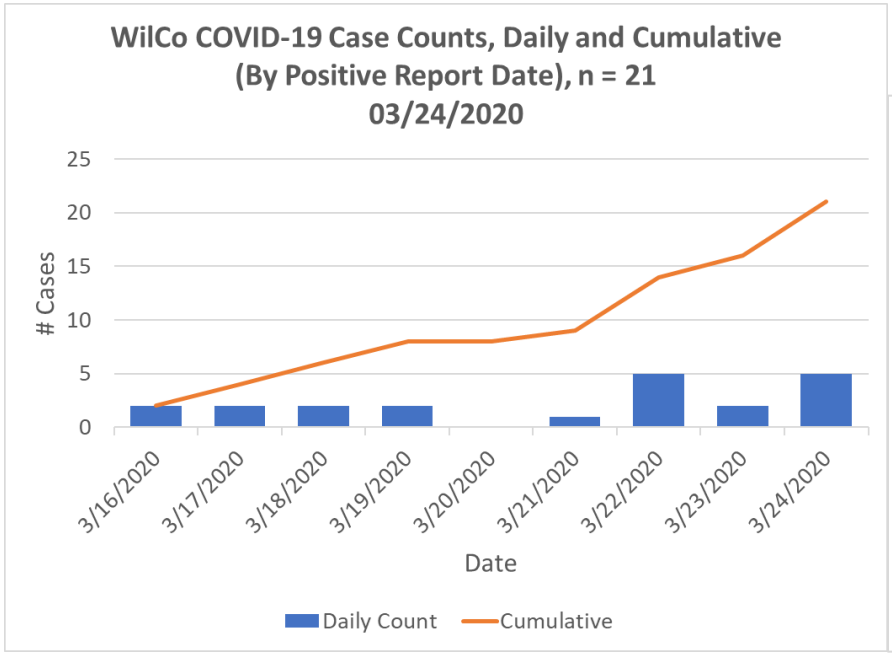
This is not a new discovery. We can see the effect of strong community NPIs in the 1918 Spanish Flu. St. Louis reacted quickly and decisively to implement community NPIs.

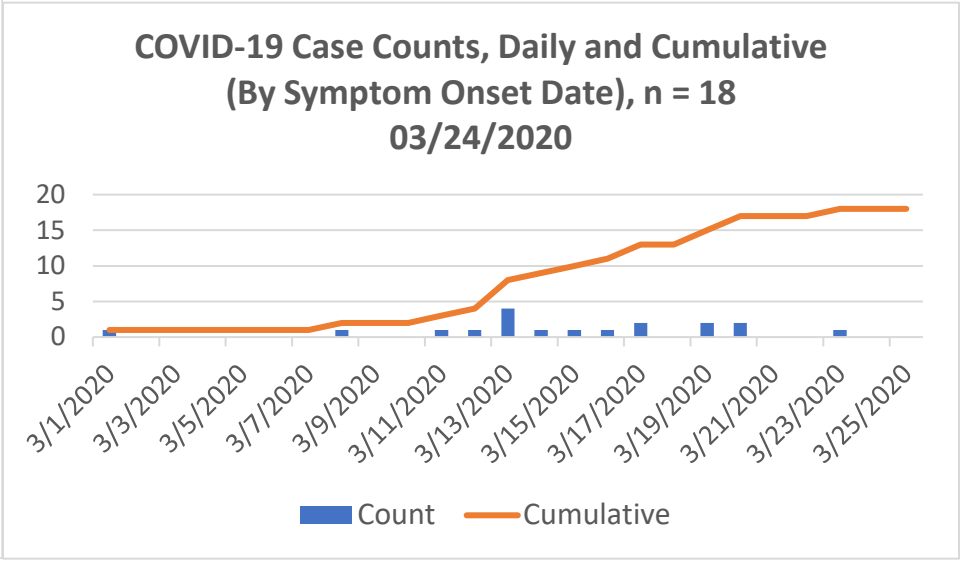


"**The difference in response times between the two cities (≈14 days, when measured from the first reported cases) represents approximately three to five doubling times for an influenza epidemic**. The costs of this delay appear to have been significant; **by the time Philadelphia responded, it faced an epidemic considerably larger than the epidemic St. Louis faced.** Philadelphia ultimately experienced a peak weekly excess pneumonia and influenza (P&I) death rate of 257/100,000 and a cumulative excess P&I death rate (CEPID) during the period September 8–December 28, 1918 (the study period) of 719/100,000. St. Louis, on the other hand, experienced a peak P&I death rate, while NPIs were in place, of 31/100,000 and had a CEPID during the study period of 347/100,000. Consistent with the predictions of modeling, the effect of the NPIs in St. Louis appear to have had a less-pronounced effect on CEPID than on peak death rates, and **death rates were observed to climb after the NPIs were lifted in mid-November."**

[Source: https://www.pnas.org/content/104/18/7582]

Where is WilCo at the time of stay-at-home Order?





WilCo is currently seeing a curve that mimics China's back around the beginning of February, *just before* they hit the explosion of exponential growth. China's severe community interventions — like lockdowns and city travel restrictions — were effective, but experts agree that they were implemented too late. The same story is true of Italy, and the U.S. response has also been delayed. Countries which were quick to implement testing, distancing, and NPI policies (South Korea, Singapore, Taiwan) were very successful in flattening the curve, as seen in the graphics above.

Policy Basis

Every step of the way, Williamson County's unified ICS response has been predicated on careful observation, evidence, and public health best practices. Strategies were implemented through careful consideration and deliberation and executed by policymakers with strict intentionality. Planning included a diverse group of experts across sectors, including epidemiologists, medical doctors, emergency management experts, first responders and emergency personnel, volunteer and community organizations, and agencies at the local, state, and federal levels.

Williamson County's proactive strategies focused on vulnerable populations and were aligned with CDC and WHO guidance, including the following WHO recommendations:

1. Immediately activate the highest level of national Response Management protocols to ensure the all-of-government and all-of-society approach needed to contain COVID-19 with non-pharmaceutical public health measures;

2. 2. Prioritize active, exhaustive case finding and immediate testing and isolation, painstaking contact tracing and rigorous quarantine of close contacts;

3. 3. Fully educate the general public on the seriousness of COVID-19 and their role in preventing its spread;

4. 4. Immediately expand surveillance to detect COVID-19 transmission chains, by testing all patients with atypical pneumonias, conducting screening in some patients with upper respiratory illnesses and/or recent COVID-19 exposure, and adding testing for the COVID-19 virus to existing surveillance systems (e.g. systems for influenza-like-illness and SARI); and

5. 5. Conduct multi-sector scenario planning and simulations for the deployment of even more stringent measures to interrupt transmission chains as needed (e.g. the suspension of large-scale gatherings and the closure of schools and workplaces).

The U.S. national response was ill-equipped to deal with this pandemic. By the time the first cases of COVID-19 appeared in the U.S., there were few available test kits (and those available were beset by problems), inadequate supplies like personal protective equipment, and a chronically underfunded public health infrastructure.

Without the means to carry out adequate surveillance for early contact tracing, jurisdictions like Williamson County have been forced to reply upon social distancing, community education, and community interventions (like the "Stay-at-home" Order) out of sheer necessity. There are simply no other viable strategies to effectively break the chain of disease transmission, other than measures which physically keep people from making the contact needed to spread this disease.

Additional Sources evidencing strong community NPIs for disease response

1. Report of the WHO-China Joint Mission on Coronavirus Disease 2019. https://www.who.int/docs/default-source/coronaviruse/who-china-joint-mission-on-covid-19-final-report.pdf

2. Community Mitigation Guidelines to Prevent Pandemic Influenza – United States, 2017. https://www.cdc.gov/mmwr/volumes/66/rr/pdfs/rr6601.pdf

3. Impact of non-pharmaceutical interventions (NPIs) to reduce COVID19 mortality and healthcare demand. https://www.imperial.ac.uk/media/imperial-college/medicine/sph/ide/gida-fellowships/Imperial-College-COVID19-NPI-modelling-16-03-2020.pdf

4. Public health interventions and epidemic intensity during the 1918 influenza pandemic. https://www.pnas.org/content/104/18/7582

5. "They have changed the Course of this outbreak: Revelations from handling of coronavirus in China." https://www.cbc.ca/news/health/covid-19-china-epicurve-1.5479983

6. Phone booths, parades, and 10-minute test kits: How countries worldwide are fighting Covid-19. https://www.vox.com/science-and-health/2020/3/22/21189889/coronavirus-covid-19-pandemic-response-south-korea-phillipines-italy-nicaragua-senegal-hong-kong

7. The impact of transmission control measures during the first 50 days of the COVID-19 epidemic in China. https://www.medrxiv.org/content/10.1101/2020.01.30.20019844v4