

- “For vast swathes of the globe, the pandemic will leave deep, deep scars,” UNDP Administrator Achim Steiner said. “Without support from the international community, we risk massive reversal of gains made over the last two decades and an entire generation lost.”
- Hospitals and clinics in developing countries are likely to be overrun and under resources, further risking the spread of the COVID-19 virus. Up to 75% of people in least-developed countries lack access to soap and water
- The stranded millions of migrant workers who were forced to walk hundreds of miles to their home villages after public transport shut down. --india
- “Communities do not have water and soap. They are unable to sit home and wait. There is no food, they earn their income on a daily basis.”
- The World Bank and the International Monetary Fund (IMF) needed to provide debt relief to developing countries.
- “Poorer countries will take the hardest hit, especially ones that were already heavily indebted before the crisis.

### Infection Control

- “Infection control prevents or stops the spread of infections in healthcare settings.”
- There are two tiers of recommended precautions to prevent the spread of infections
  - Standard precautions for all patient care -- they are based on a risk assessment and make use of common sense practices and personal protective equipment.
  - Transmission-Based precautions -- precautions for patients with known or suspected infections -- what we are going through rn
    - Ensure appropriate patient placement
    - Use personal protective equipment (PPE) appropriately
    - Limit transport and movement of patients
    - Use disposable or dedicated patient-care equipment
    - Prioritize cleaning and disinfection of the rooms
- How infections spread -
  - “Germs are a part of everyday life and are found in our air, soil, water, and in and on our bodies. Some germs are helpful, others are harmful. Many germs live in and on our bodies without causing harm and some even help us to stay healthy. Only a small portion of germs are known to cause infection.”
  - An infection occurs when germs enter the body, increase in number, and cause a reaction of the body.
  - Three things that are necessary for an infection to occur
    - Source “A Source is an infectious agent or germ and refers to a virus, bacteria, or other microbe.”
    - Susceptible person “A susceptible person is someone who is not vaccinated or otherwise immune, or a person with a weakened immune system who has a way for the germs to enter the body. For an infection to occur, germs must enter a susceptible person’s body and invade tissues, multiply, and cause a reaction.”
    - Transmission “Transmission refers to the way germs are moved to the susceptible person. Germs don’t move themselves. Germs depend on people, the environment, and/or medical equipment to move in healthcare settings.”

- The \$750 billion agreement for economic relief package to replenish small businesses for emergency funds as well as to expand coronavirus testing around the country.
  - The agreement would include \$300 billion to replenish the emergency fund, called the Paycheck Protection Program; \$50 billion for the Small Business Administration's disaster relief fund; \$75 billion for hospitals and \$25 billion for testing.
    - Nearly after two weeks, the \$350 billion small business fund "ran dry"
    - There were still applicants in line and moved to a risk of more bankruptcies
  - "With lawmakers scattered across the country, many in states that are restricting travel, House and Senate leaders will most likely try to approve any agreement during procedural sessions this week as opposed to bringing their rank and file back to the Capitol to vote. But during procedural sessions, any one lawmaker could object, delaying final passage."
  - They are on the stimulus 3.5 package and are working on elements of a fourth package
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#### [The Week in Business: Everyone's Broke, and Relief Runs Dry](#) - 4/19

- April 12-18th
    - 5.2 million people filed for unemployment bring the total from the past four weeks to 22 million and people are struggling because the \$349 billion program ran out of money
    - "Consumer spending online, in brick-and-mortar stores, and at bars and restaurants fell 8.7 percent from February, by far the biggest and fastest drop in the nearly three decades that sales data has been recorded."
  - relief funds from the Treasury Department = up to \$1,200 per adult, with an additional \$500 per child.
    - many people with overdrawn checking accounts saw their stimulus money garnished by their bank
      - technically legal but defeats the purpose of Americans putting the cash toward immediate needs like rent and food.
  - The plans for April 19th-25th are: Trump is reopening the country economy "Opening up America again"
    - Under his plan, social distancing practices could be lifted within four weeks, however he is telling governors to make that call. To reopen businesses, schools, and other every day services in their states.
      - Public health experts say that the country should not reopen until rapid-testing kits are widely available, and that Mr. Trump's plan could lead to a disastrous resurgence of infections.
  - trade negotiations were suspended in March because of the pandemic, but they are set to resume this week by videoconference.
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#### [How Ruth's Chris Got an Extra Helping of Small Business Aid Money](#) -4/19

- Ruth's Chris steakhouse, an upscale chain, was qualified for \$20 million under a provision that allowed it to seek loans for each of two subsidiaries
  - Loans are generally capped at \$10 million
  - Two huge other companies have received \$15.1-\$20 million loans
- It is usually companies with 500 or few employees who qualify for loans up to \$10 million
- The funds are going to wealthy big companies and leaving others with barely nothing to nothing

- “Mr. McGowan said the chain has furloughed 90% of its staff since the crisis, and would use the money to hire some people back. He said all restaurants deserve to tap the loans, even big ones, as they are major employers in their local economies”

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Then there are also companies like Shake Shake who are giving back their \$10 million dollar stimulus because they don't need it and are trying to help actual small businesses.

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## COVID-19: DIAGNOSTICS AND TESTING FOUNDATION FOR INNOVATIVE NEW DIAGNOSTICS

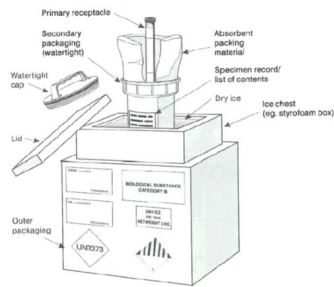
Week 1: role of diagnostics in the COVID-19 response and review different types of diagnostics and testing strategies

- Timeline continued:
  - March 12th 2020: FDA issues Emergency Use Authorization for first commercial molecular test for SARS-CoV-2.
  - March 13th 2020: FIND launched an EOI for test developers of immunoassays (manual ELISA, machine-based or lateral flow, rapid tests specific for SARS-CoV-2 antigen or antibodies) to be evaluated using a standardized, independent protocol, in collaboration with WHO.
  - April 2nd 2020: FDA authorized the first antibody test for COVID-19
- As up to 81% of COVID-19 cases are mild or asymptomatic, while 14% of cases lead to serious illness and 5% require critical care, most countries are prioritizing testing those who are critically or severely ill.
- The World Health Organization (WHO) and U.S. Centers for Disease Control and Prevention (CDC) recommend specimens from the lower respiratory tract, including sputum, bronchoalveolar lavage and tracheal aspirate for the diagnosis of COVID-19 using the approved molecular test methods.
  - nasopharyngeal swab, (preferred)
  - oropharyngeal swab,
  - nasal middle-turbinate (NMT) swab,
  - Anterior nares specimen
- Why diagnosis matters:
  - Presence or absence of infection or to detect antibodies
    - Pathogen detection
      - Molecular (detection of DNA, RNA, protein)
      - Antigen detection assays (detection of protein)
    - Host Biomarkers detection
      - Antibody detection (IgG or IgM)
- China tested as many patients as possible and hospitalized anyone who tested positive, even if they were mild cases, to interrupt transmission.
- Singapore tested all visitors and returning nationals with symptoms and did aggressive contact tracing and testing, including asymptomatic cases. Such a comprehensive testing policy is critical to ensure all the cases linked to an index case within a cluster have been identified and put into quarantine, to prevent onward transmission.
- The Republic of Korea set up drive-through testing centres to give the population easy access to testing to enable public health measures to be implemented.
- Germany rolled out comprehensive testing to allow the country to stay on top of sporadic cases initially identified.

- Nigeria and other low- and middle-income countries, realizing their constraints in funding, capacity and infrastructure, aggressively ramped up measures to keep COVID-19 from spreading as early as possible. These measures included a willingness to deploy rapid, easy-to-use tests, even if they were not as accurate as the conventional PCR tests, which require relatively expensive laboratory equipment and supplies and greater laboratory capacity.
- Peru has only two COVID-19 testing facilities, both in the capital, Lima. Although not as accurate as the PCR tests, the government is seeking a million rapid diagnostic tests and plans to use them to help hospitals gauge how many healthcare workers have been infected, and to be able to test and identify individuals and locate their close contacts. The Peruvian government also started constructing isolation centres before they had confirmed any COVID-19 cases.
- United States: Priorities for testing patients with suspected COVID-19 infection
- Tests are commercially available but not that reliable
  - IgM are the first antibodies to be detected
  - IgG can be show up for years
- At the front line of COVID-19 testing/what a day in the lab is like
  - Starts from samples
  - Then detection of genes
  - Then for report for tested genes
- Rapid scaling up of COVID-19 molecular testing has led to global shortages of molecular testing reagents for COVID-19 and ancillary reagents and supplies
- Molecular tests take longer to perform they are more accurate compared to immunoassays
  - Time frames are changing though
    - We are using molecular now for testing

Week 2: Molecular testing for COVID-19, engaging with global recommendations for their use, test selection, and explore technical and operation considerations

- According to WHO, screening by RT-PCR of a single gene target is acceptable in areas with widespread circulation of SARS-CoV-2
- How Republic of Korea dealt with it:
  - organizing over 100 testing locations, including public facilities, 81 healthcare facilities, and five commercial laboratories, to provide testing and diagnosis services;<sup>2</sup>
  - implementation of drive-through and walk-through screening centers allowing for rapid sample collection and referral for testing;<sup>3</sup>
  - rapid development and manufacturing of diagnostics within the country's biotechnology industry, including fast-tracking five COVID-19 diagnostic tests through regulatory approval, which allowed for rapid availability of tests;<sup>4</sup> and
  - use of data (e.g. from mobile phones) to monitor COVID-19-positive individuals and close contacts, facilitating self-isolation and contact tracing.
- Although the scaling up of testing for COVID-19 differs between countries, acknowledging and learning from the experiences of different countries is key to designing and implementing test scale up within your country.
- In the diagram below shows the three layers that constitute triple packaging (i.e. primary receptacle, secondary and outer packaging).



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- COVID-19 transmission is by means of respiratory droplets (>5–10µm diameter) and Airborne transmission, via smaller particles (≤5µm diameter) called “droplet nuclei”, is not believed to be a significant route of transmission for COVID-19 in the general population.
- There are additional challenges posed by the presence of closely related coronaviruses in humans and bats. Different primers and probes have different sensitivity and specificity towards the different coronaviruses, and it is essential to select the correct primer or probe for SARS-CoV-2.
- Every PCR assay has a different predefined Ct cut-off value (e.g. 38.0 in BGI, 39.0 for RdRp PCR in the Berlin protocol). If your test PCR gives a Ct value that is less than the cut-off value (e.g. 29.5), your test result is positive, meaning SARS-CoV-2 viral RNA has been detected. If your test PCR Ct value is greater than the cut-off, your test results is negative, meaning viral RNA has not been detected. For the PCR test assay to be valid, you have to look at the controls.
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Week 3: Immunoassays for COVID-19, reviewing global recommendations and the latest data informing their use. We end the course by reflecting on what the COVID-19 pandemic is teaching us and implications for the future.

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NBC News (snapchat) - April 20th 2020

- Coronavirus testing delayed.
- CDC played apart in ti
  - Tests in Atlanta broke standards
    - People entering placed with covid -19 material
    - People were not changing their lab coats and gloves before entering
  - Then they were contameded and failed to work
  - It then pushed back testing back a month
- Hospitals are cancelling other surgeries but they are trying to coming up with alternatives
  - Some have rescheduled but some have also been cancelled indefinitely

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[Health versus Wealth: On the Distributional Effects of Controlling a Pandemic](#)

- different groups prefer very different policies and it has grown into large distributional implications during this “lockdown”
- Households face the trade-off between restrictions of social interaction helping slow down the spread of COVID-19, however that hurts the economy activity
  - For example, the importance of restaurants/bars are seen as luxurious

- Now the young people who work there are out of jobs and they need to make money as they are just starting off
- “Under our baseline calibration, a comparison of the utilitarian optimal policy to the actual policy in place as of April 12 indicates that the shutdown in place is around twice as extensive as it should be. However, the optimal policy calls for leaving a partial shutdown in place through July. Ending the shutdown at Easter would have implied an additional 172,000 deaths”
- On March 21, we assume infection-generating rates fell discretely and proportionately to new lower levels. In addition, we assume that states introduced measures that effectively shut down
- a fraction of the luxury sector, therefore immediately idling 27.5% of the workforce.
- the elderly gain much more than the young from extensive reductions in economic activity than the young.
- “those working in the partially shuttered sector are the most adversely impacted, especially when it is costly to soften the distributional consequences via public transfers.”

#### [What is antibody identification?](#)

- Antibodies are immunoglobulin proteins that help protect people against microscopic invaders (viruses, bacteria, chemicals, or toxins)
- “It is created to recognise a specific structure on an invading foreign cell or particle. The specific structure that is recognised is called an antigen. Antibodies attach to the antigens, creating antigen-antibody complexes (immune complexes) that serve as signals for the rest of the immune system to destroy the cell or particle.”
- five different classes of immunoglobulins =
  - IgM = immune system
  - IgG = after the immediate threat has passed and the infection has resolved
  - IgE = primarily associated with allergies
  - IgA
  - IgD
- The first time someone is exposed to a foreign substance, like a virus or bacterium, it may take the immune system up to two weeks to make an antibody blueprint and to produce enough of a specific antibody to fight the infection.
- Vaccines use either a weakened version of the microorganism (one that cannot cause infection) or an isolated protein that mimics an antigen structure on the surface of the microorganism.
- Antibody identification tests are ordered singly or in combinations, depending on a patient’s symptoms and on what information the doctor is trying to gather. If the doctor suspects a current infection, two samples (called acute and convalescent samples) may be collected (a few weeks apart) to look for changes in antibody levels.
- Detection of IgM antibodies tends to indicate a recent initial exposure to an antigen whereas detection of total or IgG antibodies indicates exposure some time ago.

#### [Antibody Test, Seen as Key to Reopening Country, Does Not Yet Deliver](#)

- The Food and Drug Administration has allowed about 90 companies, many based in China, to sell tests that have not gotten government vetting, saying the pandemic warrants an urgent response
- Some are misusing antibody test results to diagnose the disease, not realizing that they can miss the early stages of infection
- “People don’t understand how dangerous this test is,” said Michael T. Osterholm, an infectious disease expert at the University of Minnesota. “We sacrificed quality for speed, and in the end,

when it's people's lives that are hanging in the balance, safety has to take precedence over speed."

- "The more testing, the more open the economy," Gov. Andrew M. Cuomo of New York said on Wednesday. He has pushed for the production of antibody tests as a central cog in plans to ease stay-at-home restrictions, saying that New York would eventually screen 100,000 people a day.
- In Spain, the testing push turned into a fiasco last month after the initial batch of kits it received had an accuracy of 30 percent, rather than the advertised 80 percent.
- This month, the F.D.A. warned that some firms marketing their antibody tests in the United States were falsely claiming that they had formal federal approval, or that they could diagnose Covid-19.
- Physicians say antibody tests can be useful if given as part of a broader range of care
  - However it will not allow us to open the country up as Trump says
    - We don't know COVID-19's immunity duration
- The Chicago Public Health Department bought 5,500 rapid tests and put them to use in homeless shelters as a supplement to diagnostic testing. Those who were positive for the early antibodies were placed in hotel rooms rented by the city during the 48 hours it took to get diagnostic test results back, said Dr. Allison Arwady, commissioner of the department.

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#### [Medicare for All Act of 2019](#)

The part I agree with and want to incorporate into my solution -- all of these are copied and pasted

- SEC. 101. ESTABLISHMENT OF THE UNIVERSAL MEDICARE PROGRAM.
  - There is hereby established a national health insurance program to provide comprehensive protection against the costs of health care and health-related services, in accordance with the standards specified in, or established under, this Act.
- SEC. 102. UNIVERSAL ENTITLEMENT.
  - In General.—Every individual who is a resident of the United States is entitled to benefits for health care services under this Act. The Secretary shall promulgate a rule that provides criteria for determining residency for eligibility purposes under this Act
    - may make eligible for benefits for health care services under this Act other individuals not described in subsection (a) and regulate their eligibility to ensure that every person in the United States has access to health care; and shall promulgate a rule, consistent with Federal immigration laws, to prevent an individual from traveling to the United States for the sole purpose of obtaining health care services provided under this Act.
- SEC. 104. NON-DISCRIMINATION.
  - In General.—No person shall, on the basis of race, color, national origin, age, disability, or sex, including sex stereotyping, gender identity, sexual orientation, and pregnancy and related medical conditions (including termination of pregnancy), be excluded from participation in, be denied the benefits of, or be subjected to discrimination by any participating provider as defined in section 301, or any entity conducting, administering, or funding a health program or activity, including contracts of insurance, pursuant to this Act.
- SEC. 105. ENROLLMENT.
  - include a process for the automatic enrollment of individuals at the time of birth in the United States or upon the establishment of residency in the United States
    - The individual is a resident of the United States.









individual shall not be responsible for additional out-of-pocket cost-sharing occurred during that year.

- SEC. 1102. DEFINITIONS.
    - the term “Secretary” means the Secretary of Health and Human Services;
    - the term “State” means a State, the District of Columbia, or a territory of the United States; and
    - the term “United States” shall include the States, the District of Columbia, and the territories of the United States.
-