

# Update on Omicron and Schools

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# Omicron Basics



# Characteristics: Immune Escape

- Immune system is complex
  - Antibody neutralization vastly reduced 3-6 months after shots (this is what is in the news)
  - T-cell (long term immunity) is stable
  - Natural immunity also provides protection

... need recent shot or infection to prevent against \*cases\*, some longer term immunity (severity?) from T-cells?

“Immune system is NOT a 1-trick wonder”

# Characteristics: Transmissivity

- Much higher
  - Doubling time - 2-3 days
  - Very, very fast
- Why
  - Definitely immune escape
  - Not sure more or less intrinsically virulent
  - Grows less well in lung cells, more in bronchials
    - Potential less severe infection, more transmission

# Characteristics: Severity

- This is the remaining question
  - Lower in South Africa
    - Comparable population?
    - Higher nat'l immunity / higher HIV+
  - Unknown/emerging in Europe
    - Lots of models/anxiety/misinformation
    - London hospitals: staff shortages due to quarantine

# Characteristics: Mitigation Efficacy

- Believed it is still droplet/opportunistically aerosol transmission
  - Less margin for error in mitigations – more breakthrough
- Faster time to infection
  - Exposure to symptoms can be <24 hours
  - Asymptomatic testing efficacy?

# Omicron Details (compared to Delta)

- Immune Escape: ↑
- Transmissivity: ↑
- Virulence: ????????
- Mitigations: Less margin for error

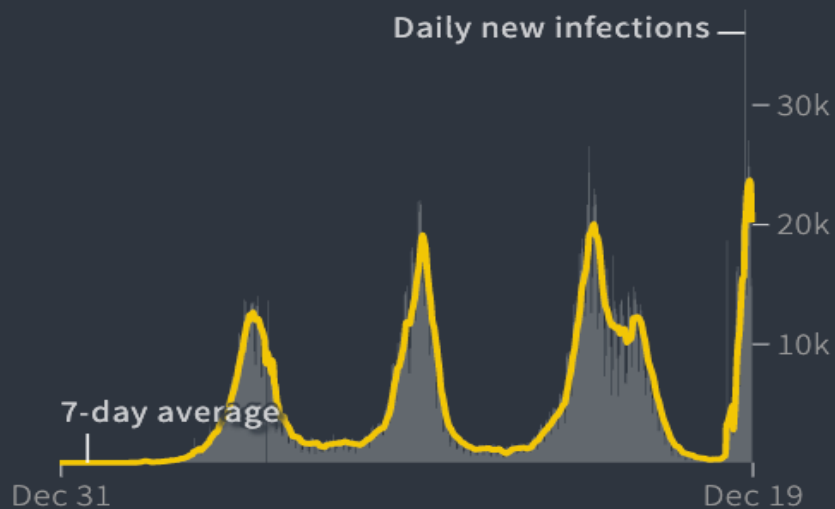


# Epi: South Africa

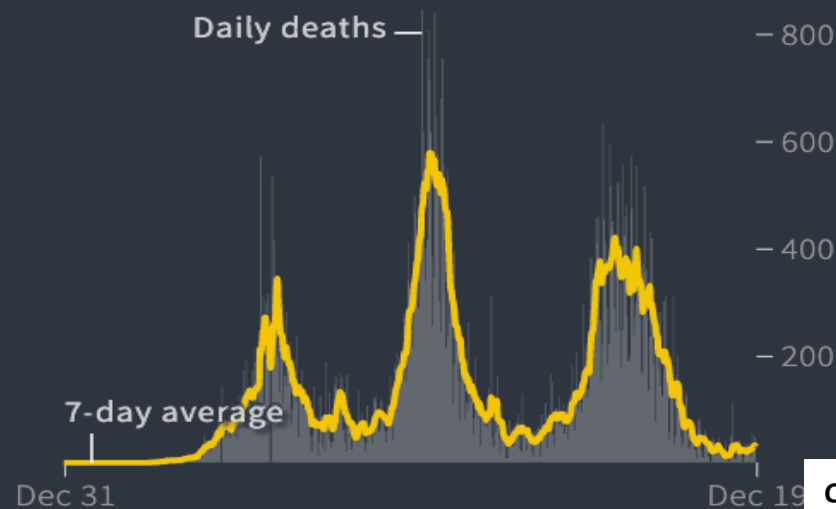
- Explosive cases – starting ~ Nov 15<sup>th</sup> (peak 12/16)
- Low hospitalizations (incidental, observational)
- Populations: High Nat'l Immunity / High HIV
- Delta wave \*over\* before Omicron started

## Daily reported trends

### New infections



### Deaths



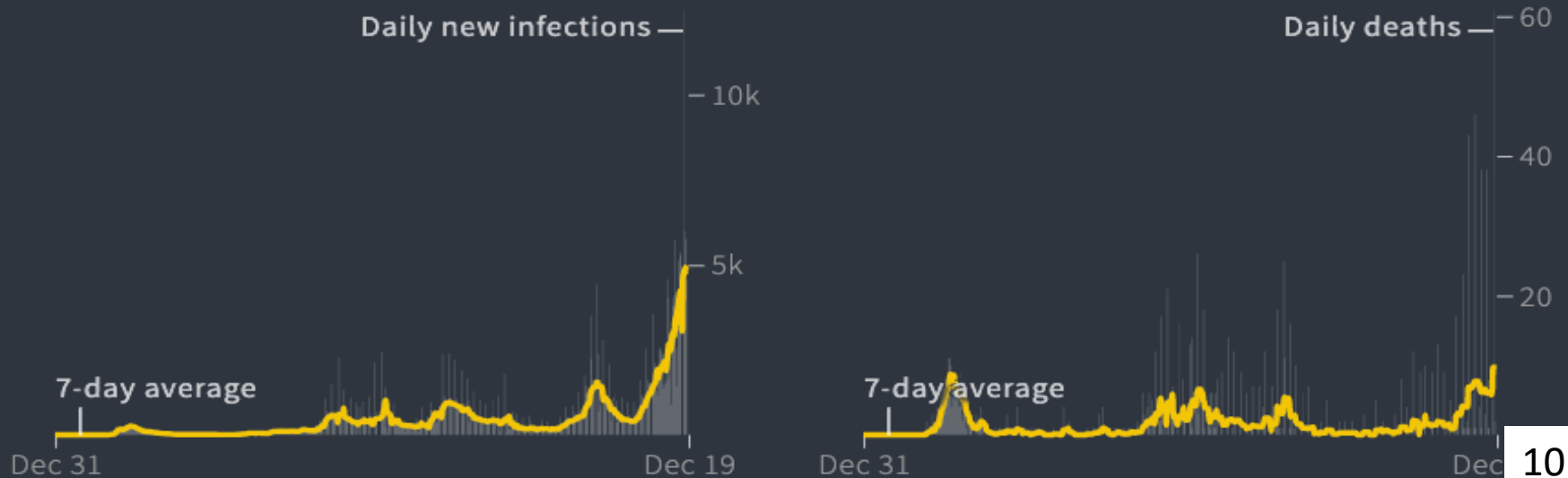
# Epi: Norway

- Pre-existing Delta wave
- Super-spreader event with Omicron
- Concurrent, Omicron overtaking Delta

## Daily reported trends

New infections

Deaths

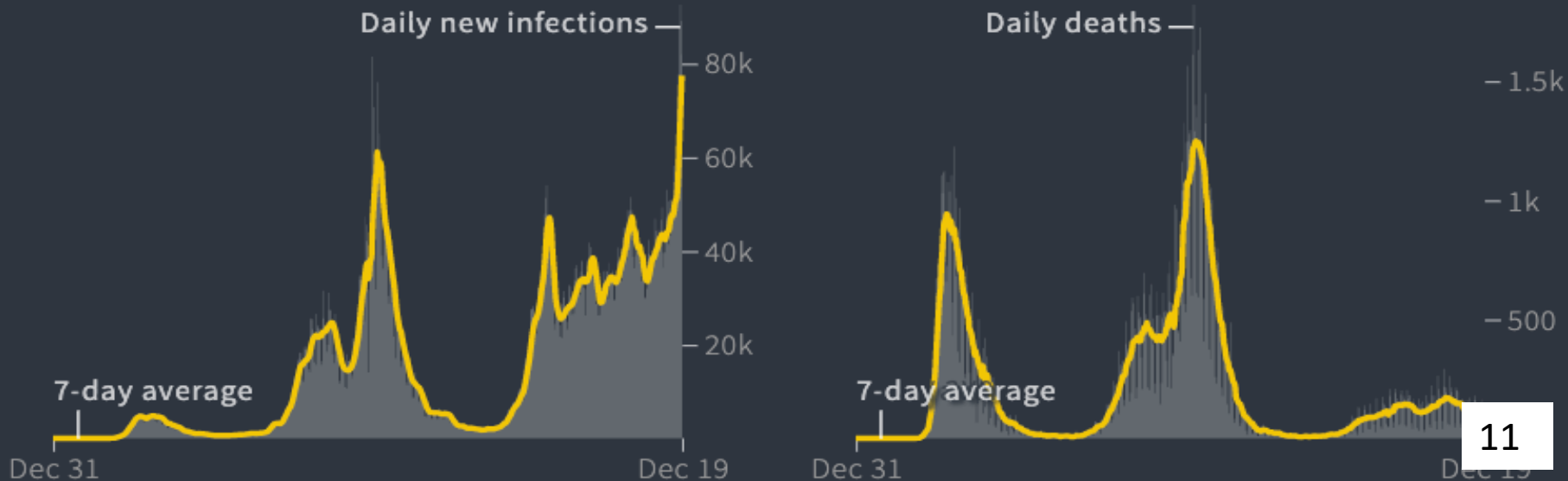


# Epi: UK / London

- Existing Delta – cases/deaths delinked vaccination
- Spike with Omicron – dominate in London

Need care in comparing to other countries

Daily re  
New infec



# Impacts of Remote Schooling

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Current National / State Level Policy:

Biden: Test-to-stay adopted nationally

DESE: Prioritization of in-person learning

- In person schools increasingly important for students

# Mitigations and Transmission in In-Person Learning in Somerville

- Somerville mitigations - Intensive
  - Required vaccination/testing in staff – 94% fully vaxx'd
  - Testing: Asymptomatic/Symptomatic/Test-to-Stay
  - Masks, PPE, HVAC, Distancing, etc., etc.
- Quite successful in Alpha & Delta
  - “Can’t rule out in-school transmission”
    - 2 in Spring 2021 (both mask protocol breakages)
    - 5 in Fall 2021 (more breakthrough... more transmissive)
  - Process and numbers are both expected & impressive
  - School has been “safe”

# What about Omicron and Schools?

- Currently not enough information to decide
  - Recommend: No decisions yet
  - Need to balance risks and benefits of COVID and schools
- What I'm watching (closely!)
  - Hospitalization numbers ??
    - Particularly in at-risk / >65's
  - Logistics of health-care staffing
    - Quarantine / availability of staff
  - Breakthrough on mitigations
    - Expected (more transmissive), unclear how much ??

# What can we do – RIGHT NOW

- Vaccinate
  - A recent shot for everyone, ESPECIALLY high-risk
  - Test immediately before any indoor, unmasked contact
- Understand cases are not the primary metric
  - Cases will go very high in next weeks
  - Contact tracing already discontinued in Massachusetts
  - Likely: asymptomatic/minor cases reporting changes
  - Prepare for treating minor cases at home (like before with kids)
    - Stock up (medicine, supplies)
- Follow hospitalizations / health-care capacity
- Follow national and state policy, decisions to come

# The future ...

- Omicron spike will be fast
  - January / early February
  - Best case: Natural immunity gained, low severity
  - Worst case: Natural immunity gained, high severity
- There will be new variants over time
  - Maybe we have a nat'l immunity break after Omicron (?)
  - New variants will evolve (in humans (and animals?) )
  - Eradication is very, very, very unlikely
    - Smallpox: only humans, 100% symptomatic, very good vaccine
  - Hopefully, we end up as a commonly circulating cold
    - Long timeline, not linear to get there



# Annexes

# History

- 20-30% of colds caused by coronavirus
- Emerging evidence these entered the human population
  - Very deadly
  - Mutated to become less virulent/more transmissible
    - “Common Cold”

# Theories for Omicron Evolution

1. Carried in immunocompromised person for long time (untreated HIV+, chemotherapy)
  - Mutations accrued over time
  - Genetic transfer with co-infection with cold
  - .. Ongoing transmission
  - This route is more likely to lead to less virulence
2. Human -> Animal -> Human double crossover
  - Long time to mutate in animal host
  - Crossover .. Ongoing transmission
  - This route is more likely to lead to random virulence

# The future (2) ...

- Adaptive strategies prioritizing in-person whenever possible
  - Back-up to remote depending on severity for as short of time as possible (following policy)
  - Provide as much support to most at-risk students and essential worker (HCW) caregivers as possible
  - Consider “out of the box” thinking
    - Tufts (2021): Delay Jan start / cancel Spring Break
    - Other things that are feasible (the above may not be)

# Ethical Decision Making

- We lockdown to “flatten the curve” to:
  - Prevent overwhelming our health-care system, ensure care for everyone.
  - Provide time for vaccines, treatments to come out
  - Prevent death, and disease, morally to protect at-risk/elderly.
- That must be balanced with:
  - Right to education, need for economic activity, etc.
- At this point, unclear what balance is for Omicron.
  - Unlikely to have any interventions in time (so fast)
  - Unclear what severity is here in US
  - Unclear how to keep health-care system best operational
- Easy to make decisions at extremes (that aren't what life is)
  - If it's a 2-day cold for everyone, stay open.
  - If severe outcomes, lockdown.
  - We're in the middle of defining where we are between those points.