CSE

SCHOOL OF ENVIRONMENTAL COMMUNICATION
AAETI

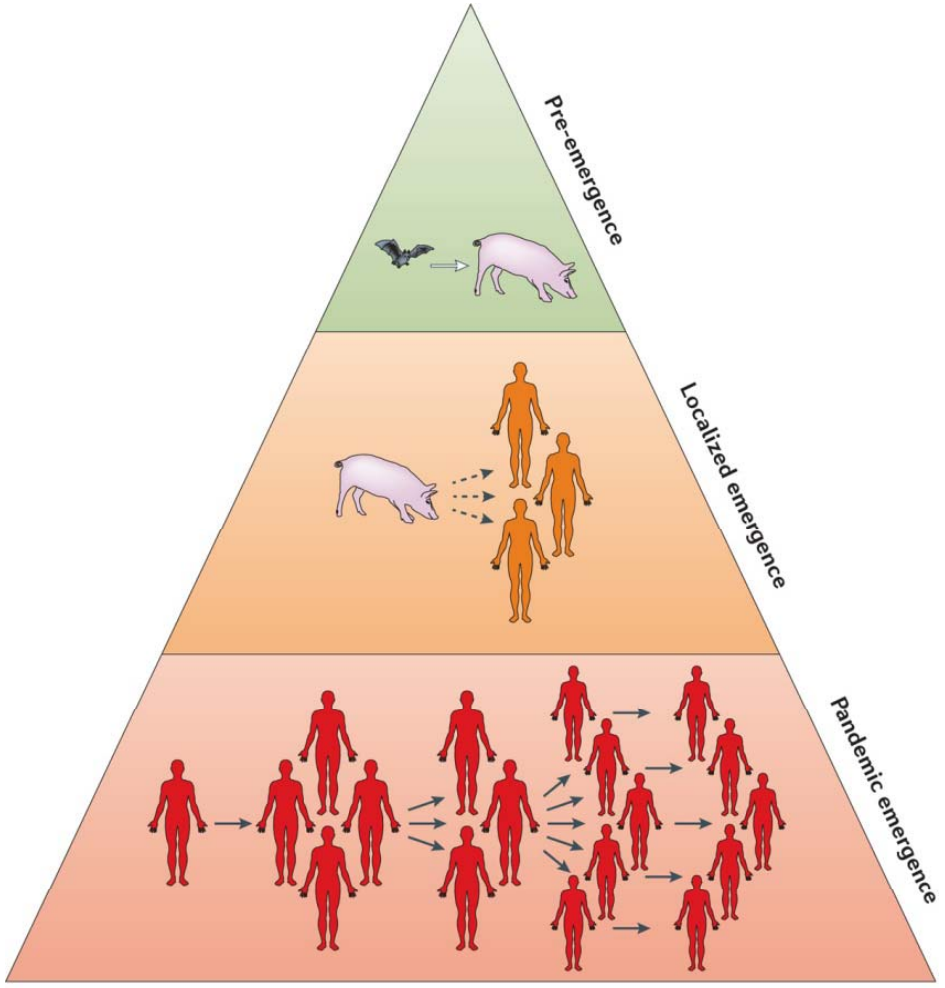
ANIL AGARWAL DIALOGUE 2022

How genomics can help understand the viruses in our environment and connect the dots for pandemic preparedness

Anurag Agrawal

Zoonotic origins in Pandemics

- Points of detection higher in the chain give higher opportunities for prevention



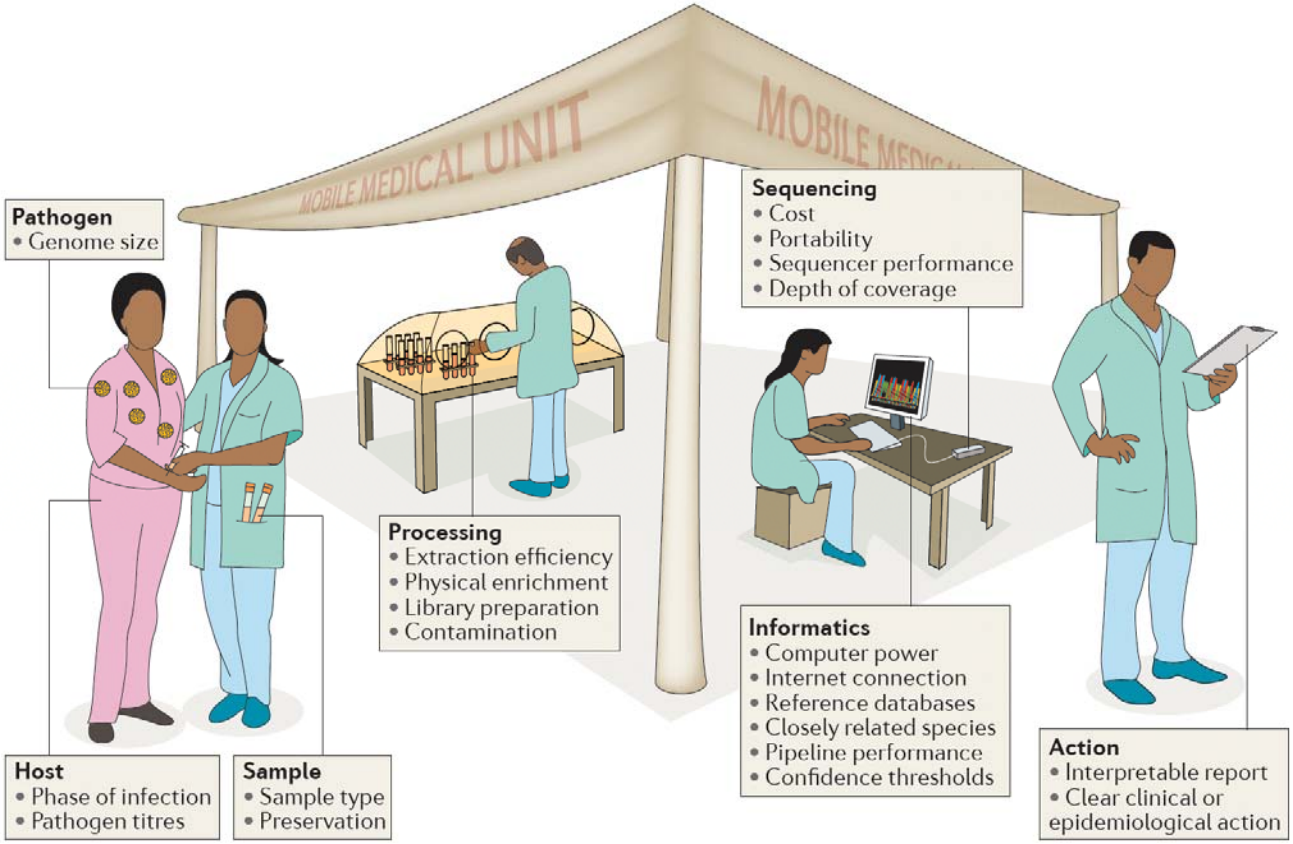
REVIEWS

APPLICATIONS OF NEXT-GENERATION SEQUENCING

Towards a genomics-informed, real-time, global pathogen surveillance system

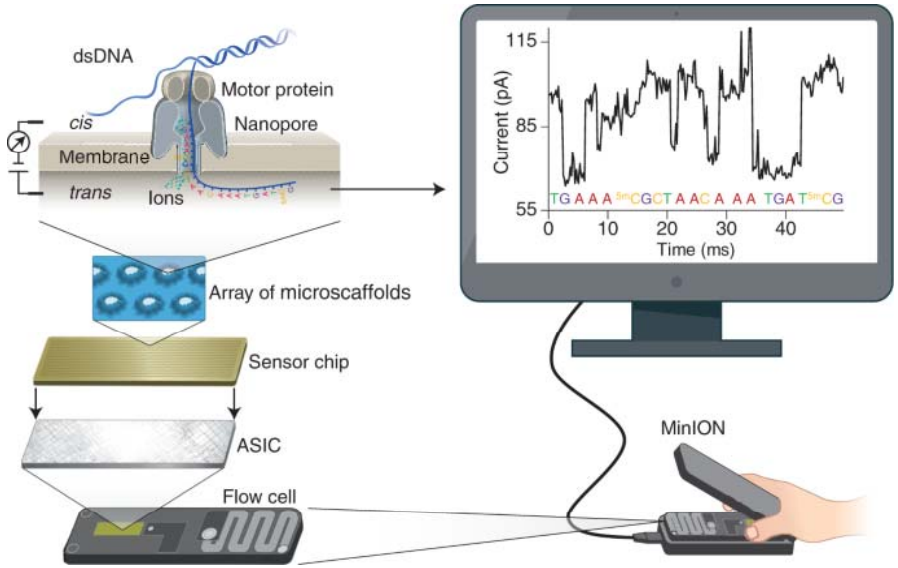
Jennifer L. Gardy[1,2] and Nicholas J. Loman[3]

Can genome sequencing be mobile?



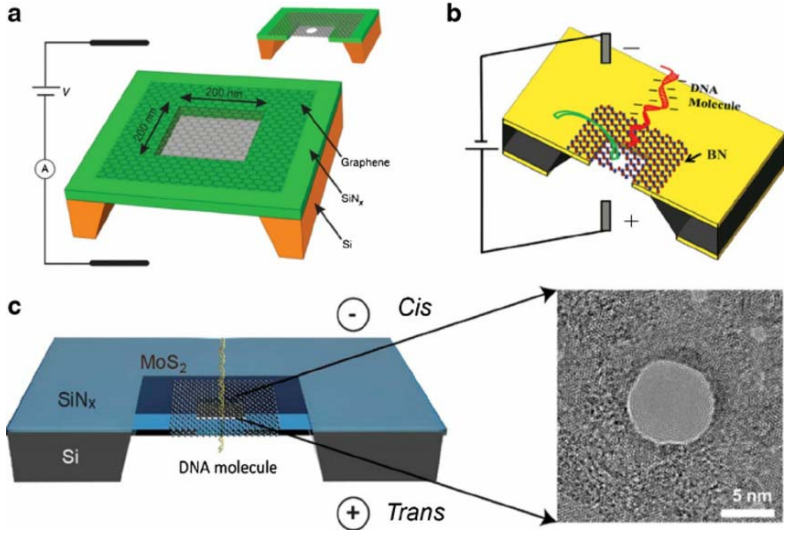
COVID-19 - MicroLab
Genomics for Surveillance & Genetic Epidemiology

Oxford Nanopore based Pathogen Detection



Affordability, Low-resource, Speed and Sensitivity

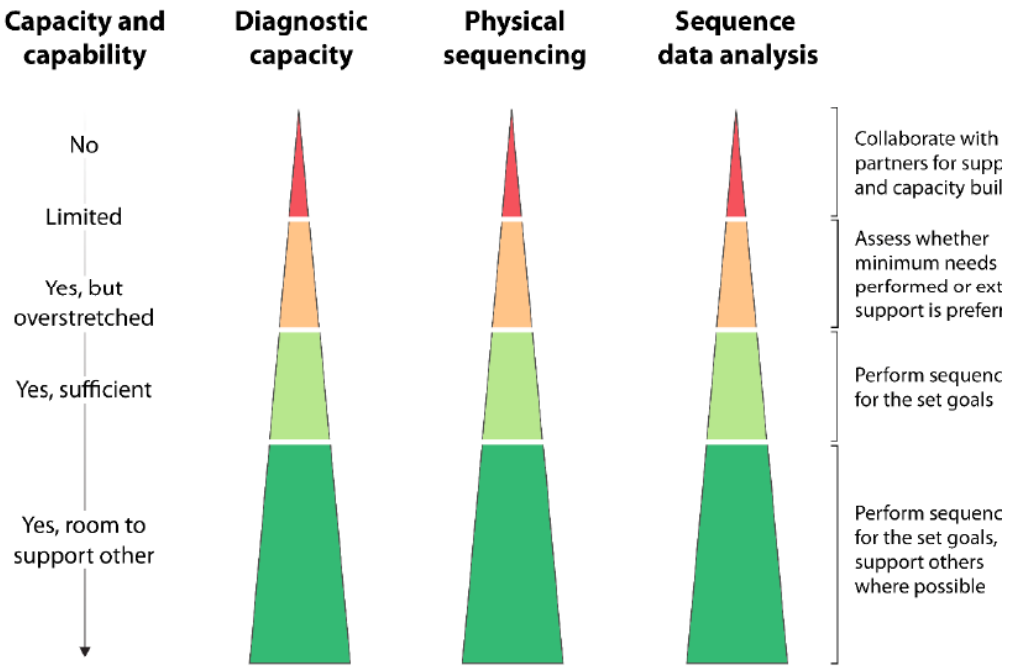
Other options coming



Micro Labs

- Affordable
- Fast
- Low infrastructure requirement
- Low to Medium throughput

Designing a genome surveillance program



SARS-CoV-2 genomic sequencing for public health goals

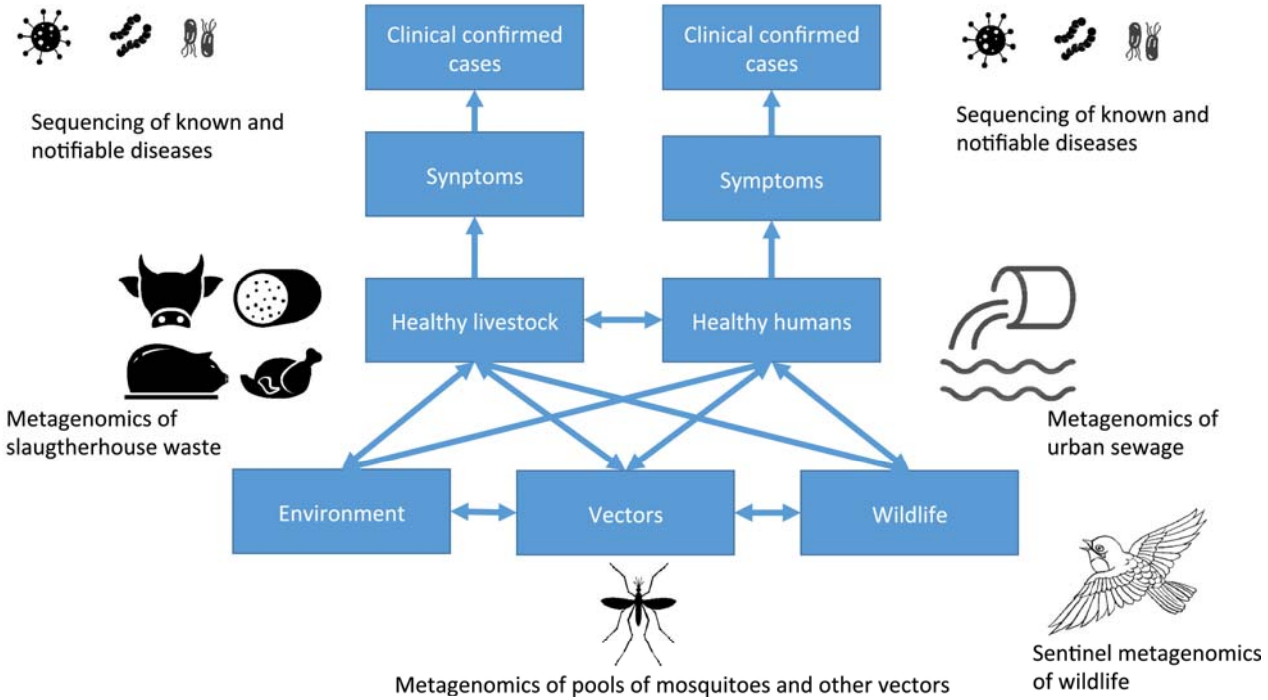
Interim guidance

8 January 2021

World Health Organization

What / How to sequence?

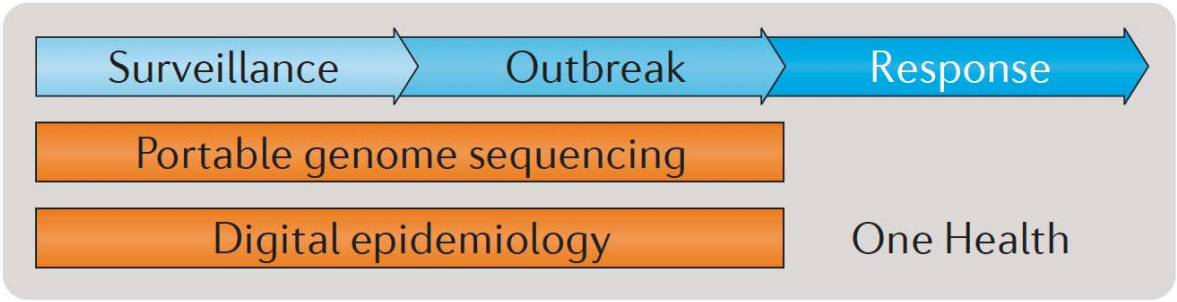
- Sentinel sampling
- Natural reservoirs or pools
  - Sewage

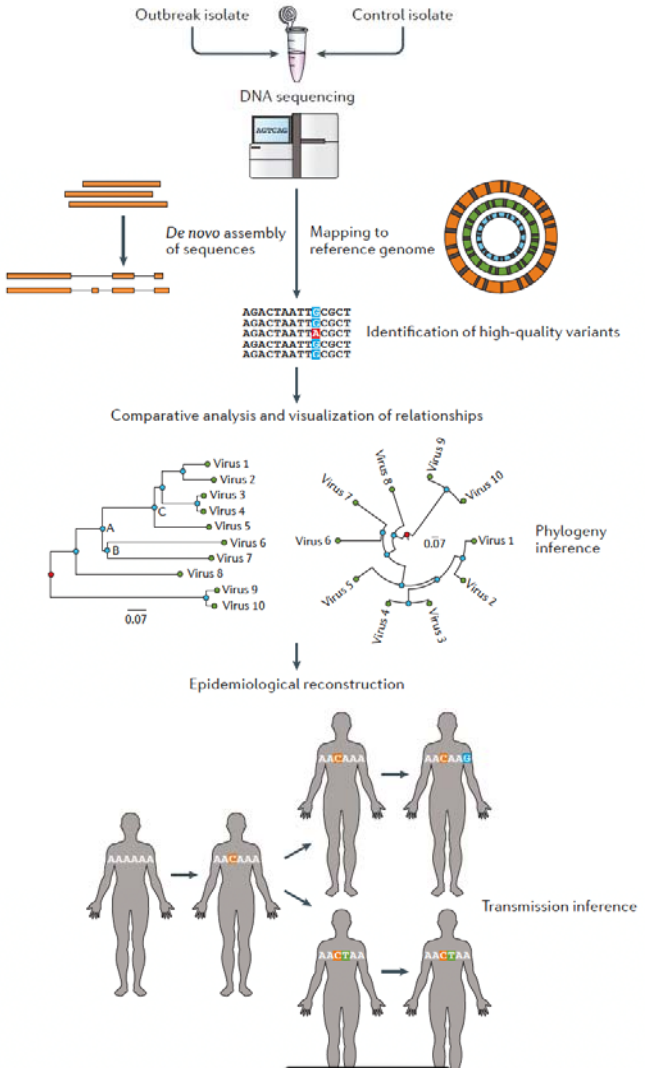


F.M. Aarestrup et al. / The Lancet Regional Health - Europe 9 (2021) 100210

To detect in the field

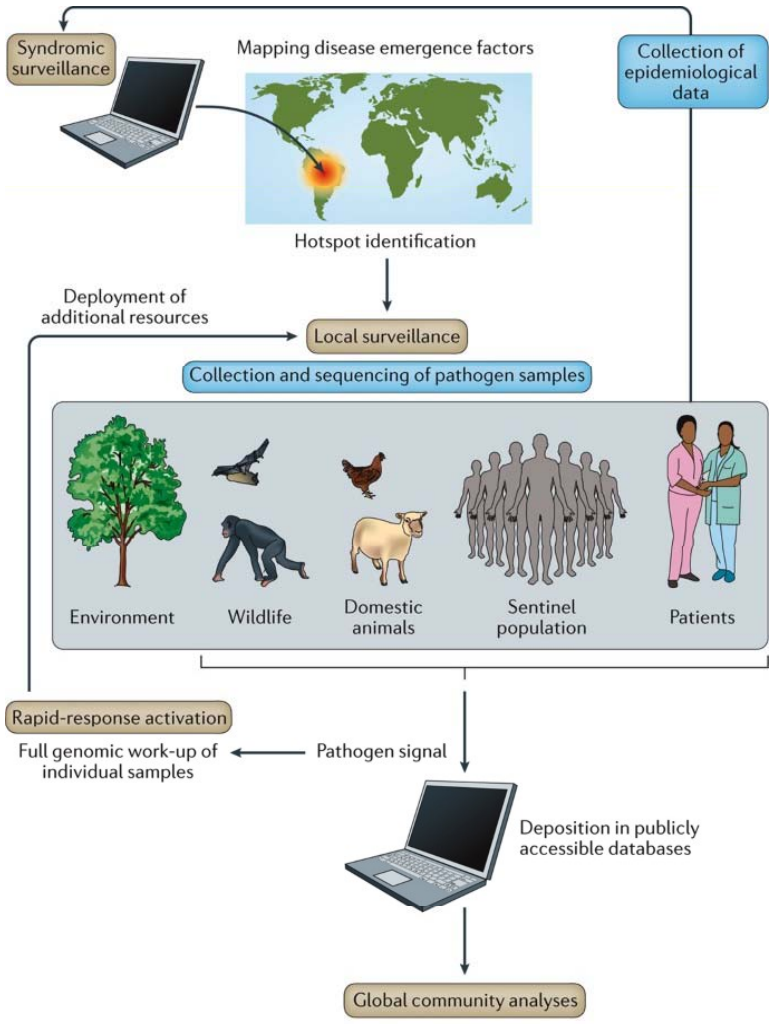
- Non-trivial
- Sequencing + Informatics
- Clinical + Epidemiological correlation





Pandemic Preparedness

- Intergrated One Health programs
- More than just enhancing surveillance and coupling it to novel technology — it is about engagement, trust, cooperation and building local capacity



Thank you