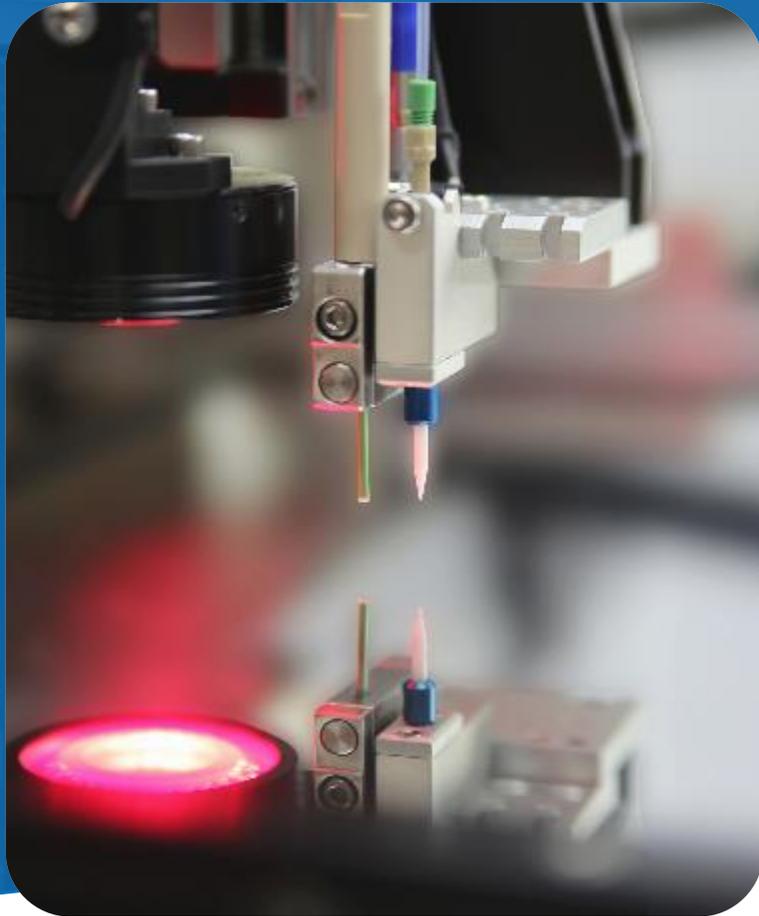


Scaling Beyond COVID Rapid Testing



COVID Accelerated Virtual Healthcare & Decentralized Testing



Ongoing Virtualization of Healthcare

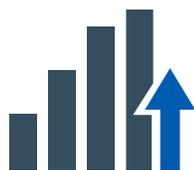
"Durative Paradigm Shift"

- At-home / POC health testing was an ongoing trend among telehealth and DTC health startups before COVID-19
- Telehealth utilization is an indicator of increasing virtualization of healthcare
- Telehealth adoption and the virtualization of healthcare will likely have a lasting impact on POC testing demand

Accelerated Telehealth Adoption



More Patients Interested in Telehealth Going Forward



135+

New Telehealth Services Added to CMS Since COVID-19



90%

Of Hospitals Expect Greater Usage of Telehealth Moving Forward

COVID-19 Demand

"Catalyst for Rapid Change"

- COVID-19 has ushered in unprecedented demand for POC testing and need to rapidly expand manufacturing capacity
- The pandemic has relieved regulatory, economic and societal barriers to POC testing, accelerating the evolution of the testing paradigm and use cases

Significant, Dispersed Demand

20 Million +

Lateral Flow Tests Needed **Daily**

40 Separate Companies

Receiving Funding to Develop Tests

Broad POC Testing Demand

"New Normal"

- POC and at-home testing supports increasingly decentralized healthcare consumption
- Increased awareness of POC testing due to COVID-19 is likely to translate to greater demand more broadly
- Human infectious disease and a wide range of additional tests are expected to see increased consumption

Broad Applicability



Infectious Disease



Veterinary



Food Safety



Allergen Testing

...and many others...

COVID Revamped Regulatory, Economic & Societal Dynamics



Late 2020

Early 2021

REGULATION

EUAs for Test Manufacturers



- ✓ Multiple EUAs for test manufacturers across a range of types including lateral flow



EUAs for At-Home Use and OTC



- ✓ Multiple EUAs for at-home test kits including DTC options signaling a broad shift to decentralized



Coronavirus (COVID-19) Update: FDA Continues to Advance Over-the Counter and Other Screening Test Development

ECONOMICS



- ✓ The NFL implemented comprehensive COVID-19 protocols, working with tests from Mesa Bio



Covid: Tests to be offered twice-weekly to all in England

It comes as Boris Johnson is due to meet the cabinet to sign off the next stage of lockdown easing in England, which will see non-essential shops, pubs and restaurants start serving outdoors from 12 April



HHS Announces \$22 Billion in Funding to Expand Testing, Vaccination Distribution

The Department of Health and Human Services (HHS) today announced two upcoming actions by the Centers for Disease Control and Prevention (CDC) to provide more than \$22 billion in funding to states, localities, and territories in support of the nation's response to the COVID-19 pandemic, as directed by the Coronavirus Response and Relief Supplemental Appropriations Act.

SOCIETAL DYNAMICS



"The consumer behavior that's been created, the new channels that we've opened up with rapid testing — whether it's airports, retail stores, more physicians' offices — the app ecosystem that we're building, all that is going to remain, and it will remain for all the other assays (tests) we currently have and will be rolling out."

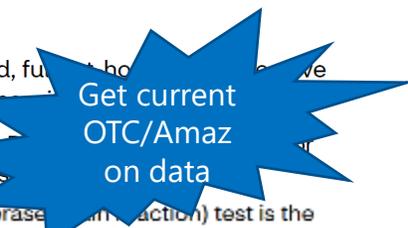
- Robert Ford, CEO



Ellume COVID-19 Home Test Kit \$38.99¹: The first rapid, fully at-home COVID-19 test to receive Emergency Use Authorization by the FDA for at-home use

Abbott BinaxNOW COVID-19 Antigen Self-Test \$23.99²: The first rapid, fully at-home COVID-19 test to receive surveillance and frequent use delivers results in 15 minutes

Pixel by Labcorp Home Collection Kit³: This PCR (polymerase chain reaction) test is the same test used by physicians across the U.S. Results typically are available within 1-2 days and can be accessed via the [Pixel by Labcorp](#) website.



Google OTC COVID 19 Tests

Rapid Test: the Faster, Scalable Testing Option

B I O D O T



Benefits of Lateral Flow

- Rapid testing, ideally at POC is required to enable early detection and response at a broader scale
- Lateral flow technology is used in both rapid antigen (early infection) and rapid antibody tests (late-stage or post infection) which can be used in a POC setting
- Results in 5-30 minutes

Significant Global Demand

- COVID-19 testing has ramped up significantly due to the critical need to contain the spread of the virus and intervene more quickly for those infected
- It is estimated that **18M – 40M** tests/day are needed across the U.S., U.K. and E.U. of which 70 – 90% will be lateral flow
- Post-COVID, systems will be used for other lateral flow applications

Public & Private Investment to Meet Demand

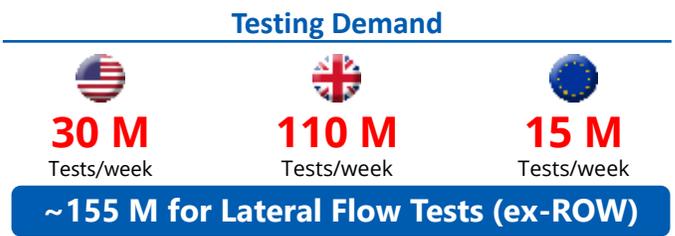
- Several governments and agencies across the U.S. and U.K. are funding COVID-19 test innovation and capacity expansion
- In addition to the government response, new companies are scaling to serve the private sector (schools, airlines and businesses) including Vault Health, Purlab and LetsGetChecked

Durable Demand Post-Vaccine Rollout

- Widespread surveillance testing for COVID-19 is expected to continue at least until vaccine use and durability have been established
- Effective and widespread vaccine rollout is far from certain in the near-term and testing demand remains unmet

“ ... The point is to use these tests frequently so people are likely to know their status early, before they transmit to others. It is frequency and speed to get results, and not absolute sensitivity of the test that should take center stage in a public health screening program to stop outbreaks ...”

HARVARD UNIVERSITY - Assistant Professor of Epidemiology, Harvard University



“ ... I see surveillance testing and reflexive PCR testing playing a lasting role in society even after the vaccine is available. There is still very little data on the longevity of the vaccine and until that's known, testing will continue ...”

Rapid Test: COVID Success Stories



- Abbott saw rapid demand growth for its POC lateral flow tests for COVID-19
- Producing 50M tests per month, Abbott uses, high-volume production systems to manufacture their BinaxNOW test
- Abbott announced 400 million tests in 2020, 300 million in Q4 alone.
- **\$2.4bn** in revenue (2020).



- Developed a PCR-based, Point of Care rapid test that provides results within 30 minutes (Accula).
- Mesa was a RADx recipient and was awarded with a \$15.4 million contract (July 2020).
- Used by the NFL & NBA to test players.
- Acquired by Thermo Fisher in Jan 2021 for \$550 million.



- GenMark developed a multiplexed respiratory panel test that tests for COVID plus 20 other ailments in as little as 15 minutes.
- Requires an ePlex Analyzer (PCR based, POC)
- 95% growth in revenue in 2020
- Acquired by Roche in March 2021 for \$1.8 bn

Rapid Test: Applications **BEYOND** COVID

Broad Infectious Disease Applicability

- Infectious diseases are natural areas expected to see substantial broadening of POC testing
- Increased monitoring and diagnosis of infectious diseases using POC / at-home testing could fulfill several unmet needs and provide value to patients

| | |
|---|---|
| <p>Respiratory</p> <ul style="list-style-type: none"> ✓ Influenza A & B ✓ Respiratory Syncytial Virus ✓ Streptococcal Pharyngitis ✓ M. Pneumonia ✓ Tuberculosis | <p>STDs</p> <ul style="list-style-type: none"> ✓ Chlamydia ✓ Gonorrhea ✓ Hepatitis ✓ HIV ✓ Syphilis |
| <p>Gastrointestinal</p> <ul style="list-style-type: none"> ✓ Campylobacteriosis ✓ C. difficile ✓ Norovirus ✓ Salmonella | <p>Developing World Illness</p> <ul style="list-style-type: none"> ✓ Malaria ✓ Dengue ✓ Typhoid Fever ✓ Zika Virus |

“ ... I think COVID will permanently increase the demand for lateral flow tests. It's such a fast and cheap way to test for infectious diseases at the point of care ...”

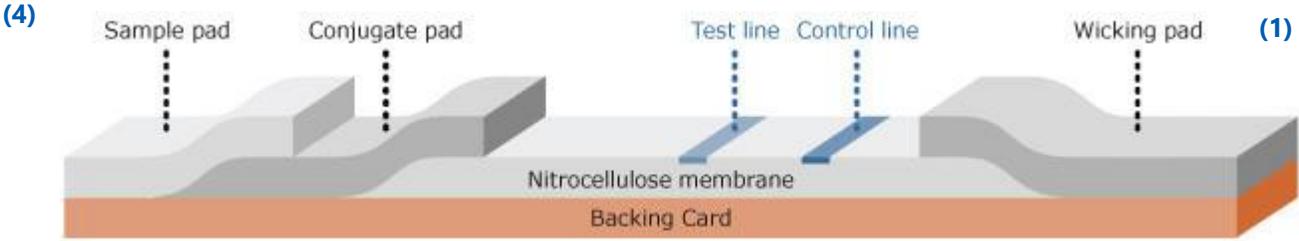
- VP of Genomics Operations & Development, Poplar Healthcare

Multiple Additional & Established Applications

- Lateral flow's low-cost nature and ability to be produced in high volumes suits it for a wide range of testing applications
- A number of well-established and growing markets currently utilize lateral flow technology to facilitate decentralized testing

| | Example End Market | Select Manufacturers |
|--|--|----------------------|
| | Food Safety <i>(i.e. milk allergen testing)</i> | |
| | Allergy Testing <i>(i.e. inhaled or food allergen testing panel)</i> | |
| | Pregnancy / Fertility <i>(i.e. at-home pregnancy test)</i> | |
| | Drugs of Abuse <i>(i.e. urinalysis)</i> | |
| | Veterinary <i>(i.e. canine, feline, equine and bovine POC testing)</i> | |
| | Environmental <i>(i.e. water safety testing)</i> | |

Rapid Test: Critical Application Needs



Multiple Materials with Precious Liquids



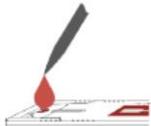
Various Material Formats



Administering Test*

TRANSFER DEVICE METHOD

1. Collect 40 µL of sample using a liquid transfer device.



2. Apply sample to the test.

3. Set timer for 15 minutes and read result.



FINGER STICK METHOD

1. Perform finger stick.



2. Touch the drop of blood to the tip of the test.

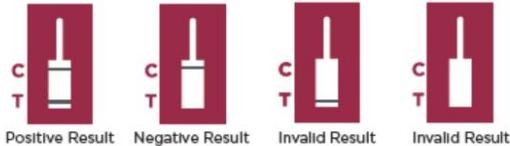


3. Set timer for 15 minutes and read result.

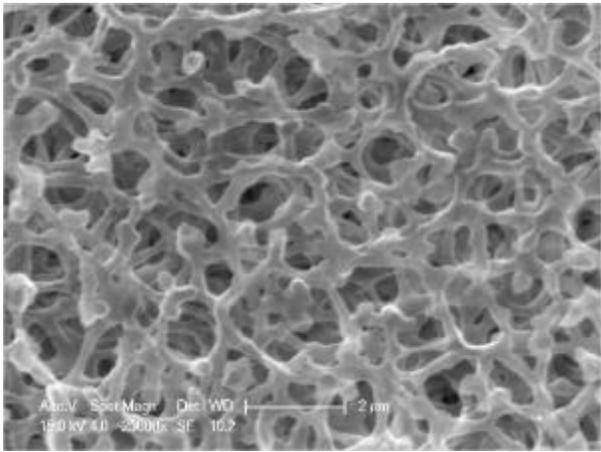


INTERPRETATION OF RESULTS

A positive result has TWO LINES, one at the "C" (Control Line) and one at the "T" (Test Line). The intensity of the lines may vary. Look carefully as lines might be faint.



Critical "Linear Placement" of Liquids

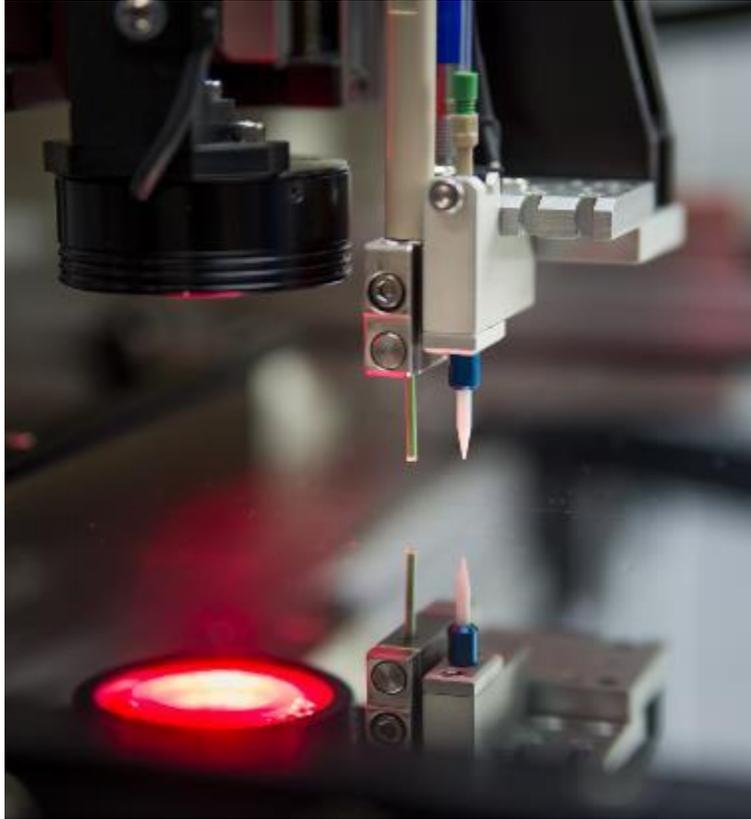


Porous Material, benefitting from non-contact dispensing

Courtesy of: (1) <https://sigmaaldrich.com>
 (2) <https://sartorius.com>;
 (3) www.osapublishing.org;
 (4) www.nowdx.com

Rapid Test: Tools Needs

B I O D O T



Dispense nanoliter (even picoliter volumes)



Start with an R&D ZX/XYZ "Batch" Card System



Assemble, Laminate and Cut multiple layers of materials, Automatically



Scale to a Reel-to-Reel System

Prior to Covid the Lateral Flow / Rapid Test Market was < \$2B

With the Advent of the Covid need for tests (2021) the Market grew to \$6.08B

The Market grew to \$6.66B by mid 2022

It is expected to grow to \$9.08B by 2026

Thank you!

