

Population Level Mass Testing to Combat COVID-19 in Nepal

www.healthfoundationnepal.org

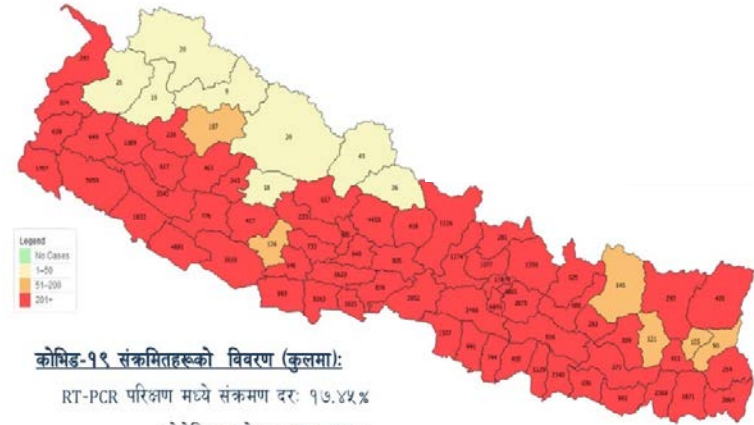
Current situation of COVID-19 in Nepal

- Daily cases ~8000 since May 2nd week
- 2/3 of the country is in lockdown since April 29
- <4% of people have been fully vaccinated
- Maximum capacity RT-PCR ~20,000/day
- Test positivity

35%
April 29, 2021



~45%
May 23, 2021



कोभिड-१९ संक्रमितहरूको विवरण (कुलमा):

RT-PCR परिक्षण मध्ये संक्रमण दर: १७.४५%

पोजेटिभ मध्ये मृत्यु दर: १.६%

जम्मा मृत्यु प्रति दश लाख (पोजेटिभमा): २०६.७

Testing Not Enough

Teku Hospital stops conducting PCR tests until further notice

Published On: © May 11, 2021 03:26 PM NPT By: Republica | [@RepublicaNepal](#)

१ जेठ २०७८, आइतबार

महोत्तरीको एउटा बस्तीमा
१५ दिनमा १३ जना
संक्रमितको मृत्यु

गाउँभरिका बिरामीमा कोरोनाको लक्षण, धामी र
जडीबुटीकै भर

निषेधाज्ञाले किन घटेन संक्रमण ?

**निषेधाज्ञाको अवधिमा
अहिलेसम्मकै उच्च संक्रमण**

‘चैत अन्तिमदेखि जेठ पहिलो साता
चुनौतीपूर्ण’

Global context facing Nepal

- **Medical supply dependencies with India**

- Scarcity of critical care facilities, oxygen supplies, medicines, test kits and PPEs
- Donations underway but too few to fulfill demands

- **Disruption of global vaccine supply chain**

- India has vaccinated only 3% of its 1.3 billion population
- Serum Institute of India will prioritize domestic demands
- Only 0.5% of people in the entire continent of Africa has received 2 doses

How to Control Pandemic?

Focus till date



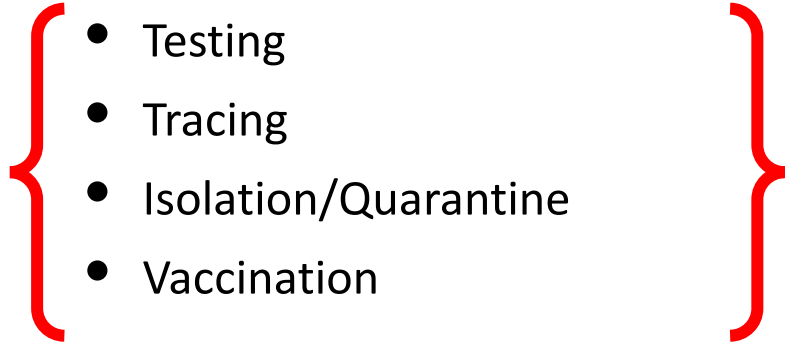
- **Hospital measures**
 - Expand ICU beds, Ventilators, Oxygen, healthcare workers

Nearly absent



- **Public health measures**

- Testing
- Tracing
- Isolation/Quarantine
- Vaccination



Mopping the Floor vs. Turning off the Faucet?



We are not breaking the chain of transmission. We are overwhelming the hospital systems.

Why conduct a large-scale Rapid Antigen Test?

- 1) Massive testing, tracing, and isolating is the only way to break the chain of transmission.
- 2) Rapid turnaround time: 15-30 mins.
- 3) PCR test capacity is at limit across the country.
- 4) Existing resources can be utilized - lab, professionals, PPE



Mass testing in four Edinburgh neighbourhoods after surge in Covid-19 cases

The latest Public Health Scotland data shows that Edinburgh has the fourth highest infection rate of the 32 local authorities in Scotland.

Subang's USJ1 free Covid-19 mass testing draws 5,096 participants with 130 suspected positive cases

Monday, 24 May 2021 02:06 PM MYT
BY MILAD HASSANDARVISH

Mass Testing: China Doubles Down on Its Covid-19 Control Plan

Mass testing has become a major part of how the Chinese government plans to eradicate coronavirus and keep the economy on track. WSJ's Chao Deng explains how the tourist city of Qingdao wants to test 9 million residents after a cluster of new cases. Photo: Agence France-Press/Getty Images

EUROPE

Does coronavirus mass testing make sense?


Austria plans to introduce mass testing for COVID-19, a measure already taken by Luxembourg and Slovakia. Should larger countries like Germany also make the effort to check their entire population?

ASIA PACIFIC

After mass testing, Vietnam says coronavirus outbreak contained

Mass Testing Protocol

- 1) All individuals (>20 years) who present with symptoms of COVID-19 in the last 7 days will be tested.
- 2) Individuals with positive antigen test results will be recommended for isolation, if possible, at home or in isolation centers that are being managed by the local government.
- 3) Contacts of individuals who tested positive will be identified and tested.
- 4) Individuals with COVID-19 symptoms but negative antigen test results will be retested or referred for PCR tests.
- 5) Repeat mass testing in the same area to identify new individuals.

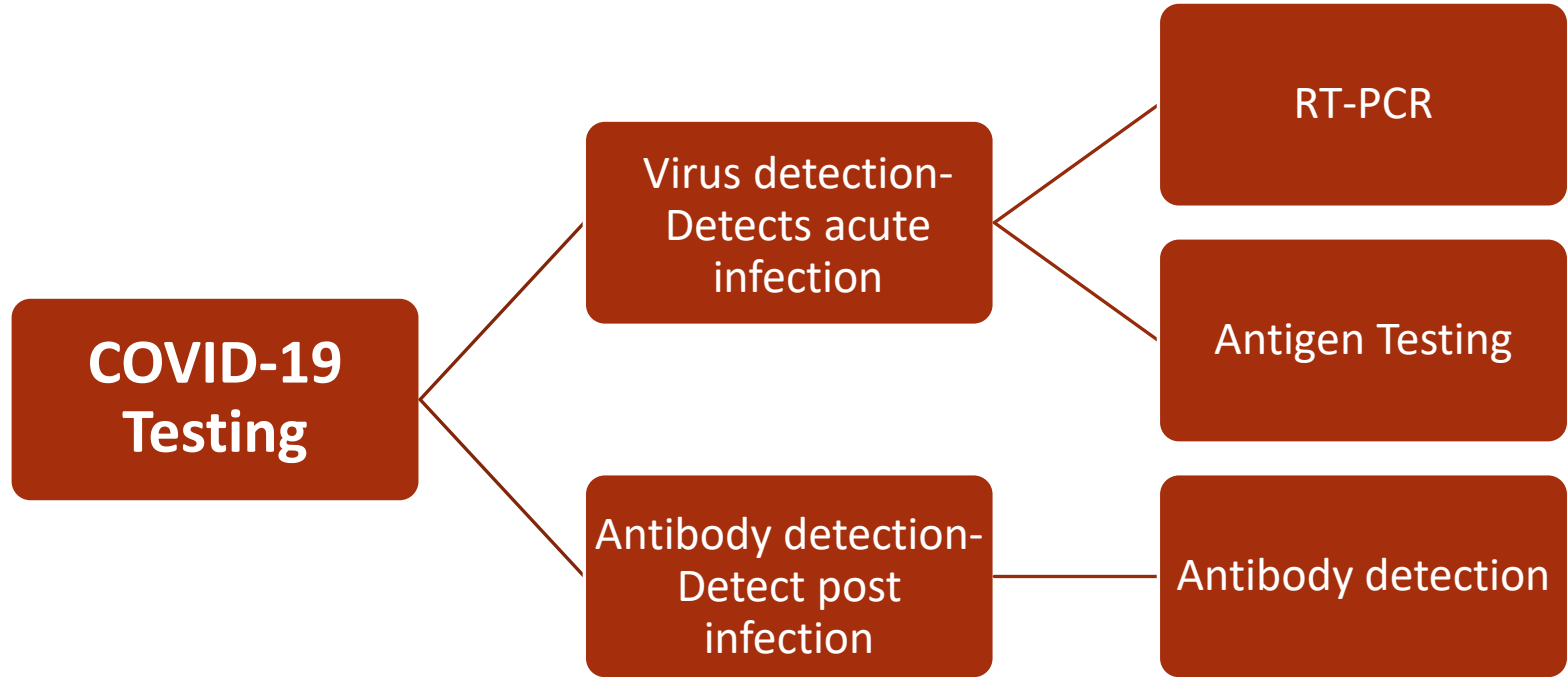


HFN will provide
Free Telemedicine
Service to all
patients in home
isolation.

What are we trying to do ?

- Demonstrate that Nepal needs to implement **Mass Testing Initiative** to break the chain of transmission
- Increase local, national and international attention from donors on the importance of mass testing, tracing, and isolation
- Decrease new cases and test positivity after 3 weeks period
- Develop a prototype and measure the effectiveness for replication by government in other places

Different Types of Testing for COVID-19



What is the solution: Antigen Testing

PROS

- Rapid diagnostic test
- Nasal or Nasopharyngeal Swab - dry swab.
- NO VTM- saves money
- Result in 15-20 min
- Very easy to deploy of mass testing
- No need for advanced training for healthcare workers
- Positive results are usually highly accurate for Diagnoses active coronavirus infection

CONS

- Negatives results are **PRESUMPTIVE NEGATIVE** and are recommended to repeat by RT-PCR (Recommendation by Manufacturer and FDA)
- Why do we need this when PCR is gold standard?
 - Because of high positivity rate and community spread in Nepal

Nepal Medical Association recommends Antigen tests

- A. **Antigen test may be used in symptomatic patients suspected to have COVID-19 within 5-7 days of onset of symptoms**, when NAAT tests are either not available or have prolonged turnaround time.
- B. **To respond to suspected outbreaks of COVID-19 in remote settings** where NAAT tests are not immediately available. Positive antigen test results from multiple suspects is highly of COVID-19 outbreak.
- C. To support outbreak investigations in NAAT-confirmed COVID-19 outbreaks. At such settings, **antigen tests could be used to screen at-risk individuals and rapidly isolate positive cases** (and initiate other contact tracing efforts).

Clinical Guidance for COVID-19 - Update 2

rates of false negative (much lower "clinical" sensitivity than claimed) and significant false positive results with the same test kits. The positive predictive value of the antigen test is expected to be higher in symptomatic patients within first 5-7 days of symptom onset. Therefore we recommend that SARS-CoV-2 antigen tests should only be utilized with the following restrictions:

- i. Only the specific brand and test kit that has current FDA EUA or FDA approval should be utilized.
- ii. Antigen test may only be used
 - a. In symptomatic patients suspected to have COVID-19 within 5-7 days of onset of symptoms, when nucleic acid amplification tests (NAAT) such as the RT-PCR tests are either not available or where prolonged turnaround times precludes clinical utility. All symptomatic patients with negative antigen test results must be tested as soon as possible with a NAAT and treated as positive until a negative NAAT result becomes available.
 - b. To respond to suspected outbreaks of COVID-19 in remote settings, institutions and semi-closed communities where NAAT is not immediately available. Positive antigen test results from multiple suspects is highly suggestive of a COVID-19 outbreak and would allow for early implementation of infection control measures. All (or at least a subset) of samples giving positive antigen test results should be transported to laboratories with NAAT capability for confirmatory testing.
 - c. To support outbreak investigations (e.g. in closed or semi-closed groups including care-homes, prisons, work-places and dormitories, etc) in NAAT-confirmed COVID-19 outbreaks. In such settings, antigen tests could be used to screen at-risk individuals and rapidly isolate positive cases (and initiate other contact tracing efforts) and prioritize sample collection from antigen test-negative individuals for NAAT.

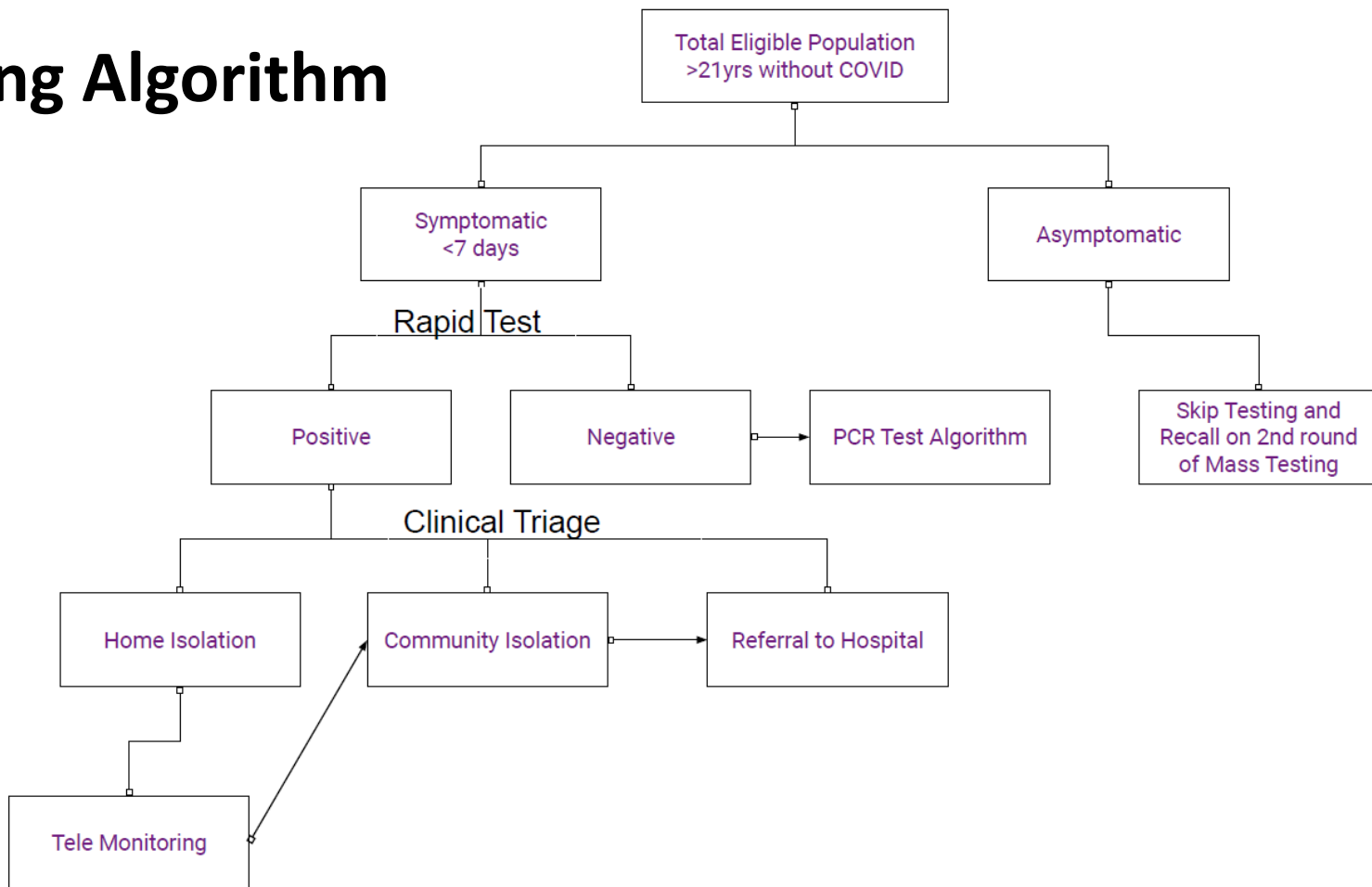
The antigen based rapid diagnostic tests should NOT be used:

- i. For asymptomatic individuals
- ii. As a substitute for RT-PCR or other NAAT where NAAT is available
- iii. For contact tracing
- iv. For any setting other than the ones mentioned above where antigen testing has been suggested

c. **Antibody Based Methods:** Certain antibody-based serological assays can be useful for

[https://nmc.org.np/files/4/NMC Clinical Guidance Update 2 Oct 21 2020.pdf](https://nmc.org.np/files/4/NMC_Clinical_Guidance_Update_2_Oct_21_2020.pdf)

Testing Algorithm



Rapid Antigen Test kits available for purchase

- All [FDA-EUA kits \(24 in total\)](#) - Expensive
- Kits available for purchase: [WHO-EUL & NPHL listed](#)
 - Abbott Panbio for IC 408 per kit
 - SD Biosensor at IC 80 per kit
 - Sure Status COVID-19 Antigen Card Test

Proposed Project Sites

Phase 1

1. Tamghas, Gulmi District. (Population - 20,000)

Phase 2

1. Tulsipur Municipality (Population 200,000)
2. Rupa Municipality (Population 15,000)
3. Kerabari Village, Morang District (Population 12,000)

Phase 1: Tamghas Municipality

- Local Leadership - Mayor and Medical Superintendent of the main hospital are involved in planning, execution and implementation.
- Hospital Lab at capacity for PCR
- Test positivity is ~45%
- Hospitals are not accepting patients without COVID results.
- The current turnaround time for PCR tests is at least 3 days
- 10,000 tests to be done

Phase 2

1. Rupa Municipality, Kaski District

- Rural but small population setting
- Partner non-profit (Nepal Development Society) has strong community support

2. Tulsipur Municipality, Dang District

- Involved local leadership
- PCR capacity is severely limited - 25km to the lab, referrals to Butwal and Nepalgunj
- Large population - 100,000 with 50% younger than 21yrs.
- Current PCR positivity: 40-50%

3. Kerabari Municipality, Morang District



STANDARD Q COVID-19 Ag

- Fast results as soon as 15~30 mins.
- Easy to use
- Specimen : Nasopharyngeal swab
- All necessary reagents provided & no equipment needed.

WHO EUL 

KOREA MFDS Approved 

TGA Approved 



WHO Emergency Use Listing for In vitro diagnostics (IVDs) Detecting SARS-CoV-2

Last update: 2 October 2020

Rapid Antigen Tests

Date Listed	Product name	Product code(s)	Manufacturer
02 October 2020	Panbio COVID-19 Ag Rapid Test Device (NASOPHARYNGEAL)	41FK10	Abbott Rapid Diagnostics Jena GmbH
22 September 2020	STANDARD Q COVID-19 Ag Test	09COV30D	SD Biosensor, Inc



WHO-EUL listed kits are approved for use in Nepal by the National Public Health Laboratory.

<https://nphl.gov.np/covid19/antigen-kits/>



Budget breakdown for Tamghas Municipality, Gulmi

Projected Total population			20000
Target testing population (>21yrs)			10000
1st Round of Mass Testing			
Expected participants 1st round (variables - significant test hesitancy and disease stigma)			2000
Expected test positives ~ 40% of tested			800
Expected home isolation patients ~85% of Positive patients			680
Expected community isolation patients (requiring O2 <3l/min or unable to isolate at home) - ~10% of positives			80
Expected hospital referrals or inpatient care ~5% of positives			40
2nd round test - repeat mass testing on Day 3 after the 1st date of mass testing			
Expected participants 2nd round (variables - improved acceptance and reduced stigma)			3000
Expected test positives ~ 40% of tested			1200
Expected home isolation patients ~85% of Positive patients			1020
Expected community isolation patients (requiring O2 <3l/min or unable to isolate at home) ~10% of positives			120
Expected hospital referrals or care ~5% of positives			60
Costs Breakdown			
Cost of SD Bio or Sure Status (rapid antigen test kit) - \$2.5 plus shipping/taxes/customs ~\$3/kit	\$3	10000	\$30,000
Community isolation center food for patients ~\$5/day X 10days (will split costs 50% with local government) - both rounds	\$50	200	\$10,000
Referral PCR costs - ~5% of tested via antigen test (symptomatic false negatives) = \$10/PCR (both rounds)	\$5	200	\$1,000
Training/PPE/logistics/hazard pay for lab & support staff (NRS 15,000 X 10 staff = NRS 150,000)	\$150	10	\$1,500
Community Health Worker's Home Isolation monitoring support			\$3,000
Administrative costs - training, travel to villages, volunteer food/supplies, phone sim/costs for tracing/data recording/reporting			\$2,000
Total Cost of Mass Testing Initiative			\$47,500

Approx. cost, including isolation - \$5/individual

Urgent Fund Request

- Cost of 6665 SD Biosensor Rapid Antigen test kits
→ USD 3 x 6665 = **USD 20,000**

Pledged amount so far:

- Health Foundation Nepal (HFN): USD 5,000
- Tulsipur Municipality: NRS 500,000

Technical Team

- **Binita Adhikari, MSPH, RN** - Research Associate, JHU Bloomberg School of Public Health & Health Foundation Nepal
- **Drona Pandeya, MS** - Laboratory Supervisor, Sonic Healthcare, Texas & Health Foundation Nepal
- **Bijay Acharya, MD MPH** - Faculty Physician, JHU School of Medicine & America Nepal Medical Foundation
- **Sanjay Gautam, PhD** - Research Officer, University of Melbourne & Non-Resident Nepali Association Australia

Thank you

For any question, please email: adhikaribinita01@gmail.com