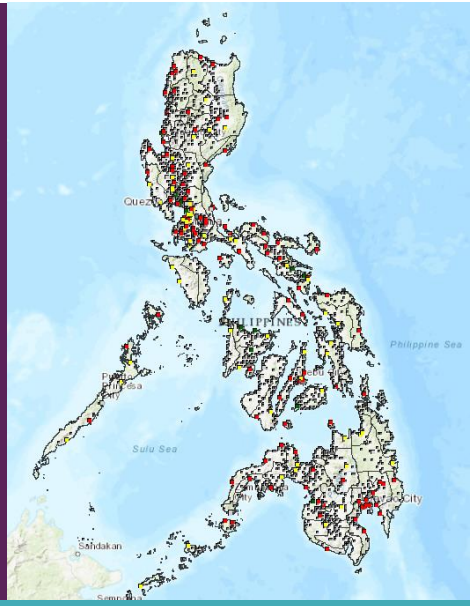
# Placing Diagnostic Devices for Impact: Experience of the Philippines

## 50th Union World Conference

**October 30, 2019**

Eddie V. Sistoso Jr., MPH, RN
Research Institute for Tropical Medicine
National Tuberculosis Reference Laboratory



# PHILIPPINES

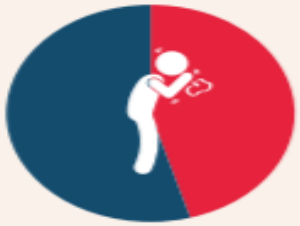
World Health Organization
WHO GLOBAL TB REPORT 2018

POPULATION: 105 MILLION

## 2017

### 581 000 FELL ILL WITH TB

408 000 males | 173 000 females | 71 000 children



317 266 TB cases notified

263 734 people not notified or not diagnosed

### 27 000 TB DEATHS

including **380 deaths** among **people with HIV**

## TREATMENT

**TB treatment coverage**

55%

2025

90% End TB operational targets

**Treatment success rate**

91%

## DRUG-RESISTANT TB

**27 000** people fell ill with **drug-resistant TB**

6 438 notified

5 623 notified and started on treatment

## TB/HIV

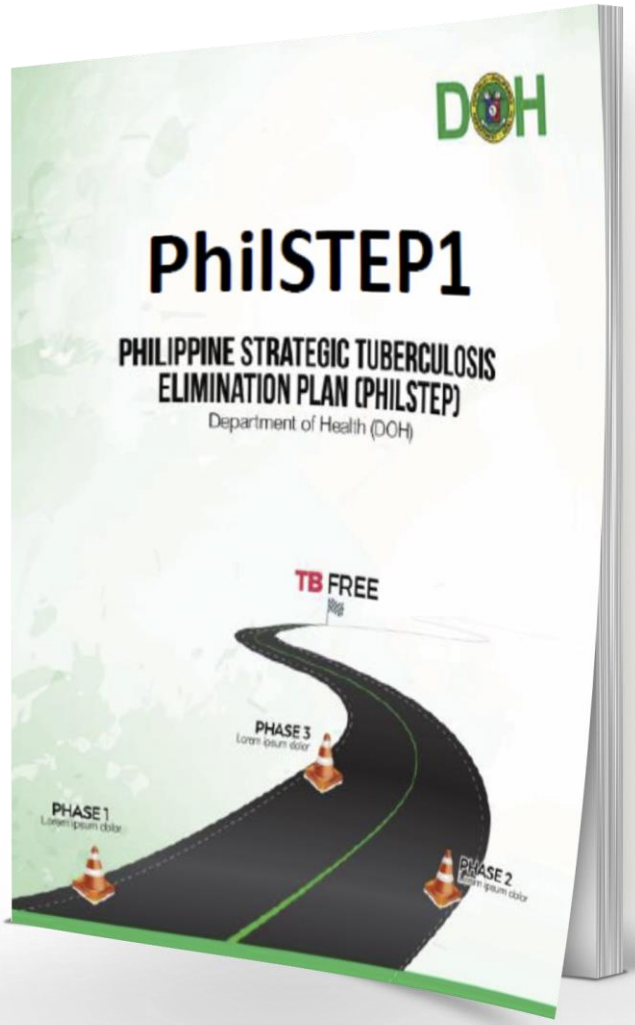
**7 100** people living with **HIV** fell ill with **TB**

# Call from the Secretary of Health:

*“We should do business unusual to eliminate TB”*

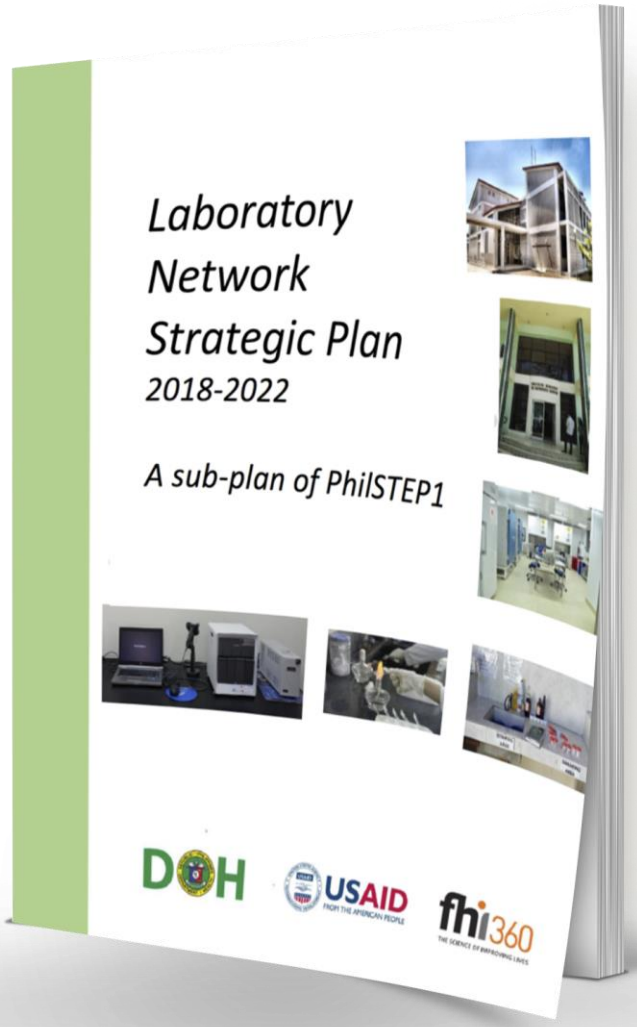
*Francisco T. Duque III, MD*

United Nations High Level Meeting on TB,
New York, September 2018




## PHILSTEP 1

- ✓ Provide integrated patient centered TB care and prevention services in all DOTS facilities




## LNSP

- ✓ Improve Access to Quality Assured TB and DRTB Diagnostic Services

# Optimizing TB diagnostic networks to improve patient access to quality TB diagnosis and treatment

## Current Status

- Low Xpert Utilization
- Limited Access to Dx Services
- Sample Referral Lacking

## Diagnostic Network Optimization

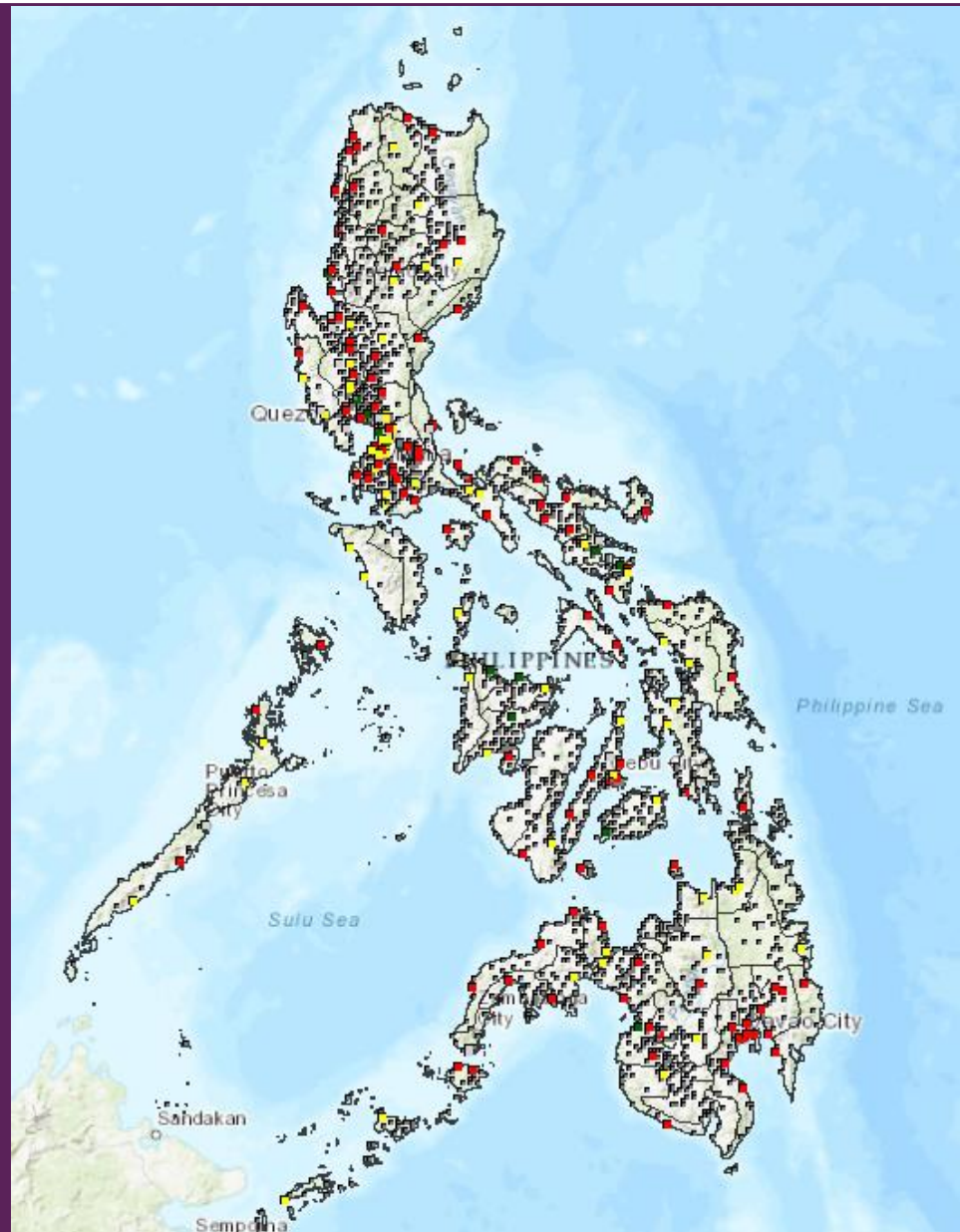
- How to improve access with current network footprint? – relocation, longer working hours, etc.?
- Can future testing demand be met without the need for capital outlay?
- How to build an efficient sample referral network to improve patient access to services?
- Are more instruments needed and if so, where to place them?

## PhilSTEP1 2017-2022

Diagnostic Network is optimized to better respond to the testing demands to reach the Philippine Strategic TB Elimination Plan: Phase1 targets

# Objectives in Philippines in 2018:

- **Map TB burden and current demand** for TB diagnostic services;
- **Map current TB diagnostic network structure;**
- Identify the **extent and distribution of gaps** in existing services according to burden of disease;
- **Develop a set of diagnostic network designs** defined by NTP and partners that better and more efficiently reach “missing” TB cases (unmet demand) using existing infrastructure; and
- **Model a set of new network paradigms** defined by NTP and partners, including new product and/or services investment, to advise government strategic planning and budgeting processes.



# Preliminary Meetings
## April 2018

INPUT

*On-site visit to an Xpert Site in Manila*

*With the staff of Tunasan Health Center*

## TB Diagnostic Network Mapping Data Requirements

### Facility Map

- Public Health Facility (locations)

### Demand Data

- Population – catchment area of health facilities
- Estimated number of cases for each HF
  - No. of patients seeking care, screened, and tested at a particular HF

### Facility Map

- Referral Pattern
- List of Facilities with Diagnostic Equipment – eg., Xpert Machine
- Xpert Site Capacity

### Cost

- Fixed Cost
  - Per Test Cost
- Site Opening Cost
- Transport Cost

# Assumptions Influencing Projections

## 2017

- Actual Baseline Data provided; number of tests in Big 3 Regions and number of tests across entire country

## 2019

- Assumed **completed rollout** of Xpert first test across all of ***Big 3 regions***
- Assumed **adherence to algorithm and well-functioning demand generation**, especially in the ***Big 3 regions***
- Assumed **well-functioning sample transport** to bring samples from TB treatment HFs to Xpert testing locations

## 2022

- Assumed **completed rollout** of Xpert first test ***across entire country***
- **Assumed adherence to algorithm and well-functioning demand generation** across the ***entire country***
- Assumed **well-functioning sample transport** to bring samples from TB treatment HFs to Xpert testing locations

# Stakeholders Meeting

April 2018
Preliminary Meeting

October 2018

February 2019

July 2019

*Presentation of preliminary results*

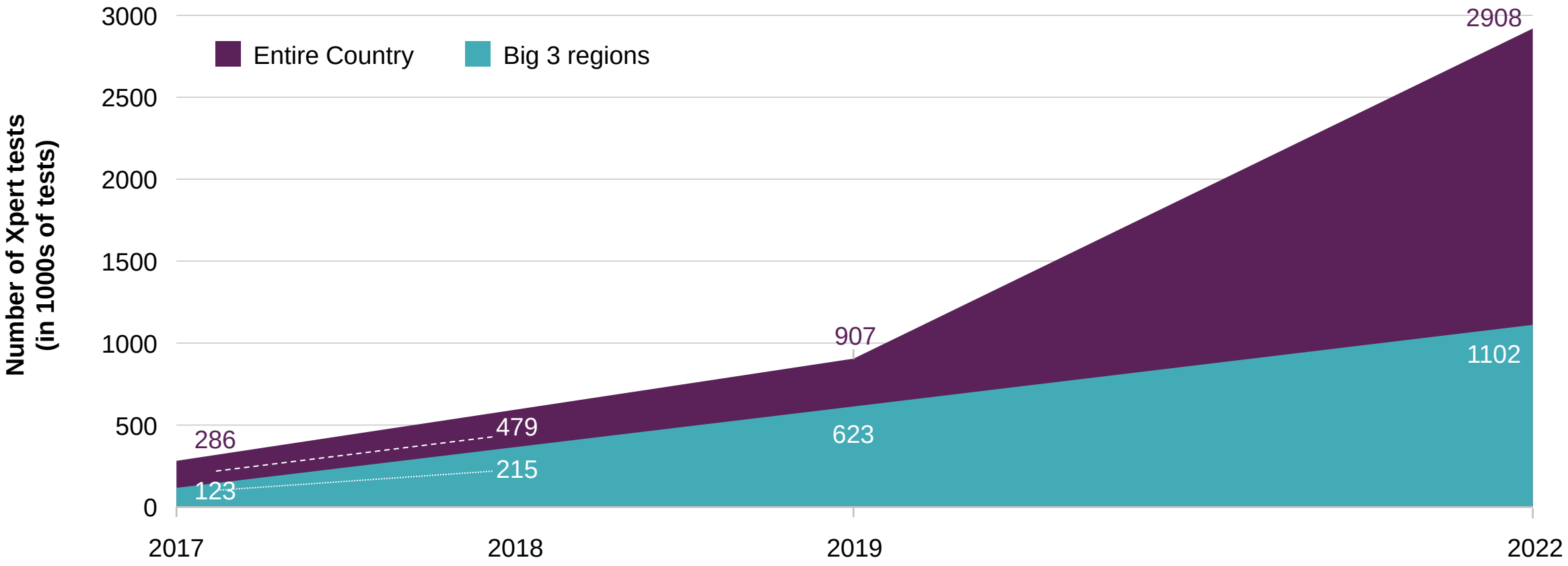
*With the NTP Point Persons*

*Presentation of  Final Results*

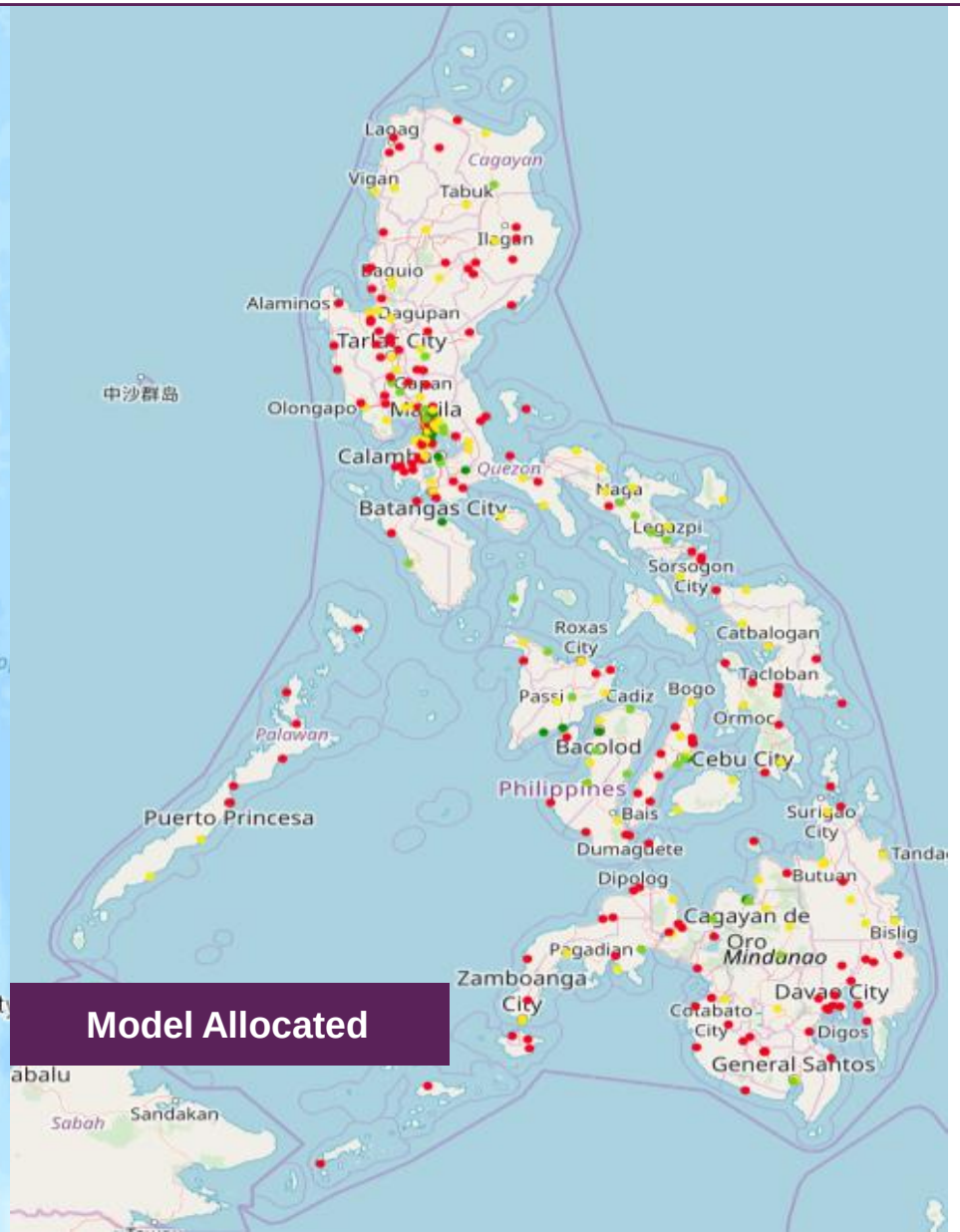
# Demand for Xpert Tests Over Time

## Future Projected Demand is aligned with PhilSTEP

Actual and Projected Demand (Number of Xpert tests) over time – Big 3 and Entire Country



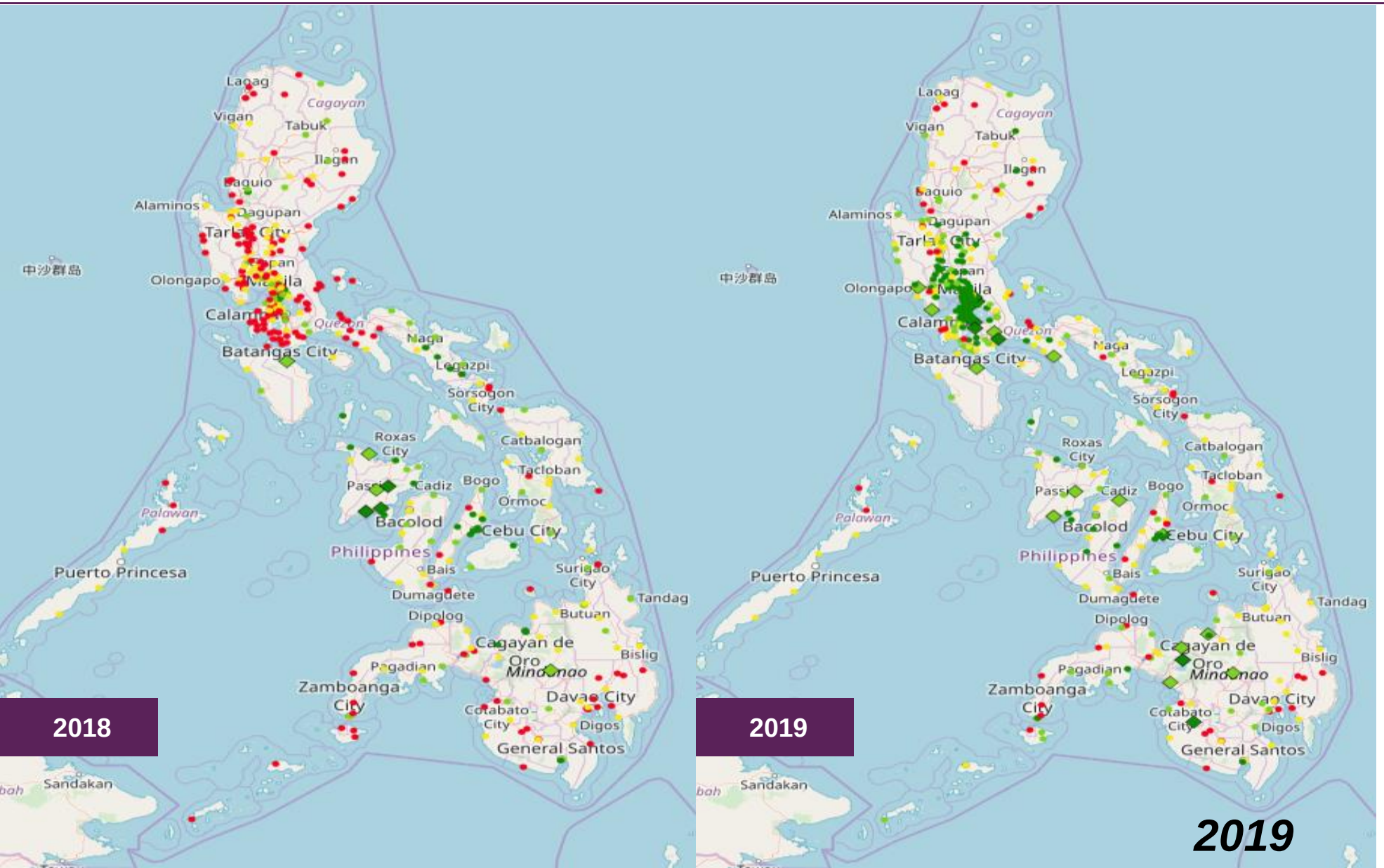
# Utilization of Xpert Testing Sites, 2017




**Key:**

- <25%
- Between 25% and 50%
- Between 50% and 80%
- >80%
- **Utilized over 3000 tests per year**

# Utilization of Xpert Testing Sites with additional 136 new instruments, 2018-2019




**Key:**

- <25%
- Between 25% and 50%
- Between 50% and 80%
- >80%
- **Utilized over 3000 tests per year**

# Key Changes

## Entire Country

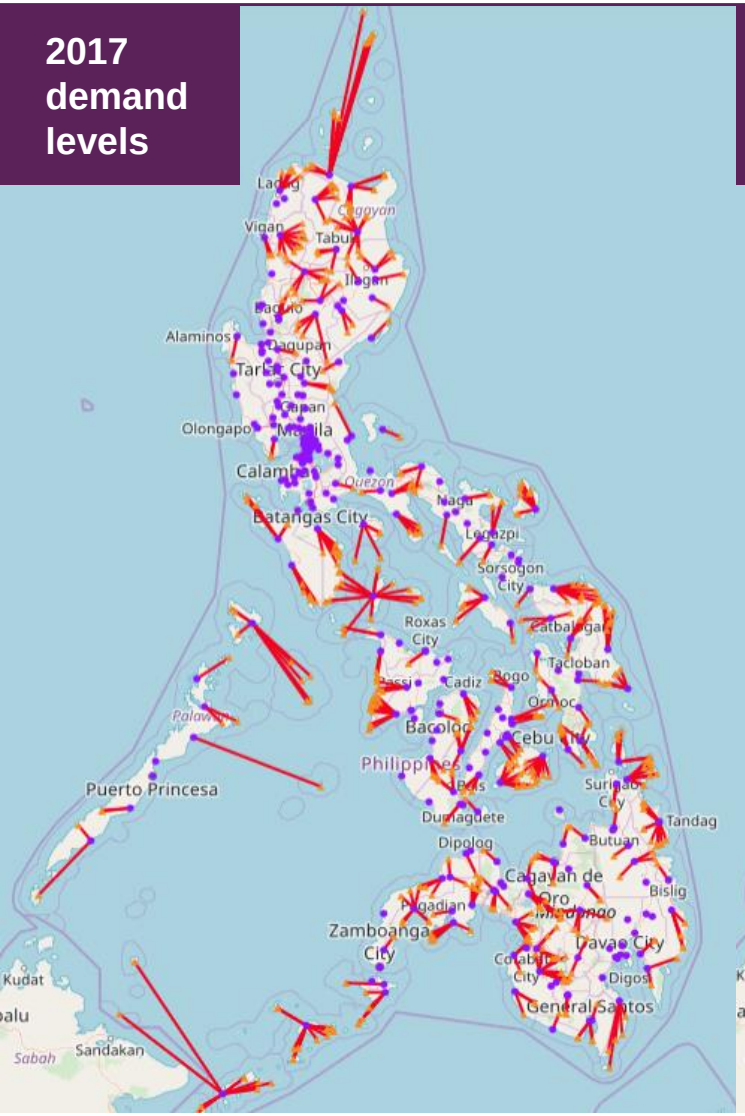
- Impose a constraint for a ***maximum service distance of 20km*** from referring HF to Xpert site
- Sample transport frequency is ***4 time per week*** from every HF. In previous optimization runs it was 2 time per week.
- ***Only public sector HFs*** (TB treatment sites) are candidate locations for placement of Xpert machines. Private sector HFs are not considered as candidate locations for placement of Xpert machines

## Big 3 Regions

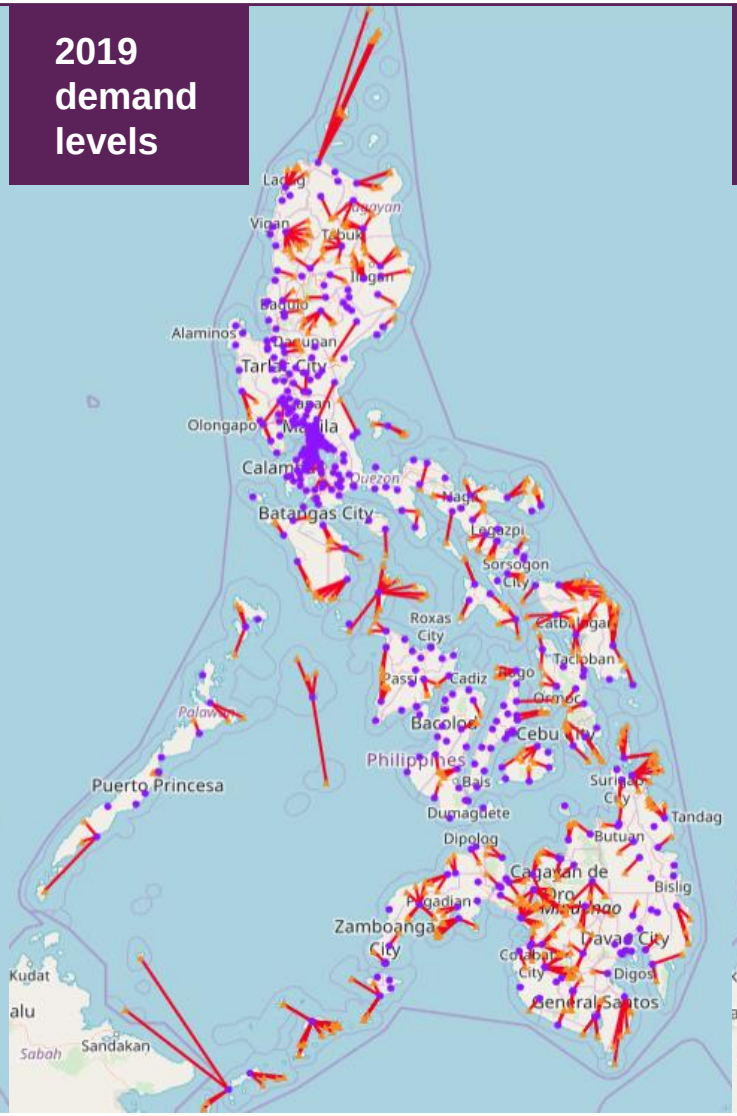
- **950 new private sector HFs** added to facility list (from FHI360 data)
- Addition of private sector HFs to support ongoing planning of private sector engagement initiatives
- Demand reallocated using PPA care-seeking percentages to split demand across HFs at City/Municipality level.

# Previous optimization runs without 20km max distance restriction

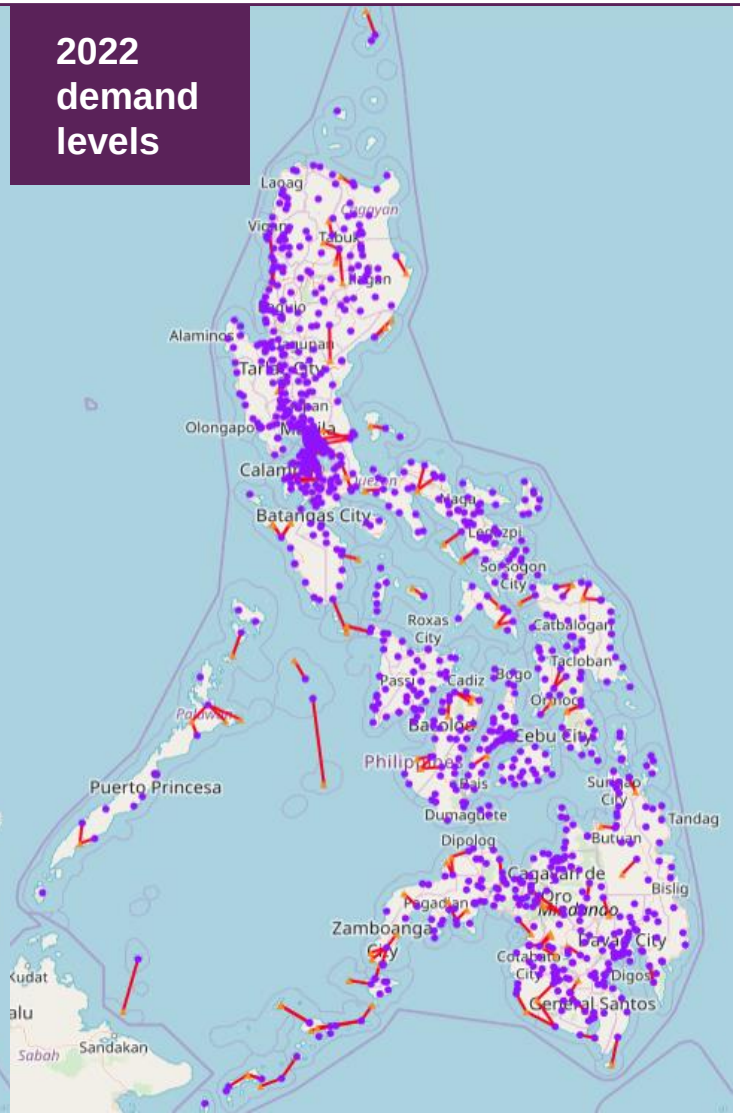
**2017 demand levels**




**2019 demand levels**




**2022 demand levels**




**Map Legend**

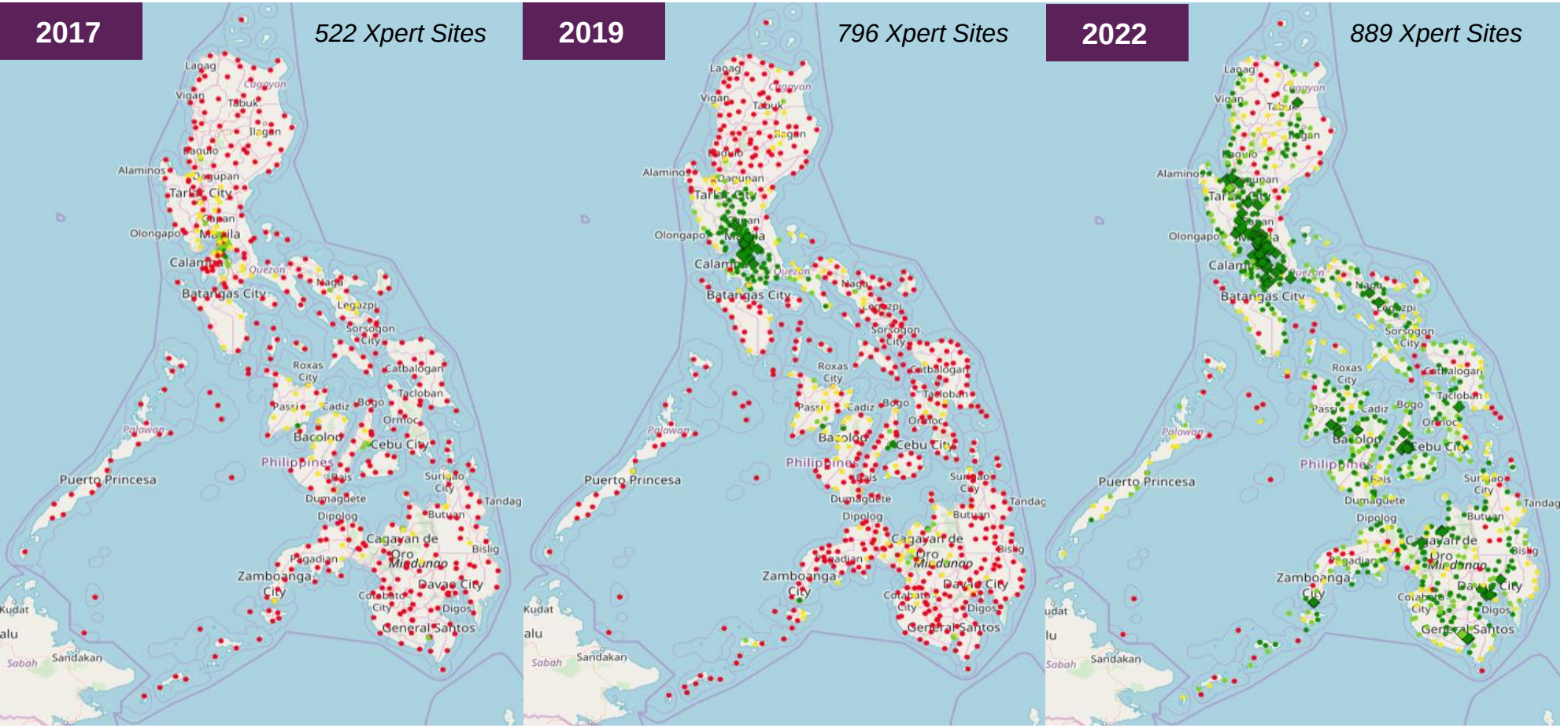
- Customer flows
- Customers
- Sites

# Demand Levels with 20 km Distance Restrictions

**2017** *522 Xpert Sites*

**2019** *796 Xpert Sites*

**2022** *889 Xpert Sites*




**Key:**

- <25%
- Between 25% and 50%
- Between 50% and 80%
- >80%
- **Utilized over 3000 tests per year**

# The addition of sites is driven by the 20km distance restriction

| | 2019 projected demand levels | 2022 projected demand levels |
|---|---|---|
| Total Xpert sites recommended by new model, with all conditions applied | 796 | 889 |
| Total Xpert sites recommended by new model, with 20km distance restriction only (and new private HFs) | 784 | 859 |
| Total Xpert sites recommended by new model, with 4x per week transport frequency only (and new private HFs) | 410 | 747 |
| Old optimization recommendation – with no distance restriction and 2x per week transport frequency | 497 (because we set this number - ran a scenario with 320 machines plus 180 planned for purchase, plus an additional 200 after that) | 747 |

*Very clear from this that the addition of sites is driven by the 20km distance restriction from HF to Xpert site*

# Output

| | |
|---|---|
| 1 | Current input for updating of **Philippine Strategic TB Elimination Plan** (PhilSTEP), **Laboratory Network Strategic Plan** (LNSP), and ***concept note*** development for **Global Fund**; |
| 2 | Model output will be used as a **guide** by **National TB Control Program** (NTP) and **Philippine Business for Social Progress – Global Fund** (PBSP-GF) in **procuring** and **allocating Xpert machines on 2020-2022**;<br>▪ Presented in National Consultative Meeting last Sept 2019<br>▪ Private sector facilities in Big 3 regions integrated into service delivery models as referral sites<br>▪ CHD Coordinators to validate the placement of the proposed list. |

# Allocation of Xpert Machine based from FIND's Model

| Region | Province | Municipality | Barangay | Rapid TB Diagnostic Laboratory (Xpert) | No. of existing machines in 2019 | No, of tests at 2022 demand levels | Proposed type of GX by 2022 | Proposed no. of machines by 2022 | Remarks | Agree? (YES or NO) | If disagree, replacement site with justification or reason for recommendation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| CAR | ABRA | BANGUED (Capital) | CALABA | ABRA PROVINCIAL HOSPITAL | 1 | 2455 | GX4 | 1 | Complete | | |
| CAR | ABRA | BUCLOC | LAMAO (POB.) | BUCLOC RURAL HEALTH UNIT | | 445 | GX1 | 1 | | | |
| CAR | ABRA | DELORES | POBLACION | DELORES RURAL HEALTH UNIT | | 1810 | GX2 | 1 | | | |
| CAR | ABRA | LACUB | POBLACION (TALAMPAC) | LACUB RURAL HEALTH UNIT | | 455 | GX1 | 1 | | | |
| CAR | ABRA | LUBA | BARIT | BARIT BARANGAY HEALTH STATION | | 1310 | GX2 | 1 | | | |
| CAR | APAYAO | CALANASAN (BAYAG( | POBLACION | CALANASAN RURAL HEALTH UNIT | | 280 | GX1 | 1 | | | |
| CAR | APAYAO | CONNER | CAGLAYAN (NEW POB.) | CONNOR RURAL HEALTH UNIT | | 455 | GX1 | 1 | | | |
| CAR | APAYAO | PUDTOL | POBLACION | AMMA JADSAC DISTRICT HOSPITAL | 1 | 470 | GX1 | 1 | Proposed GX1 but was given GX4: complete | | |
| CAR | APAYAO | PUDTOL | POBLACION | PUDTOL RURAL HEALTH UNIT | | 1400 | GX2 | 1 | | | |

Example: Cordillera Administrative Region

# Output

3

Databases of health facilities and laboratories with longitudes and latitudes coordinates were used by FHI 360 in planning and designing of specimen referral and transportation system, including Sputum Transport Rider (STRider).

# Acknowledgements


Kekeletso Kao and Team

Sidharth Rupani and Team

Dr. Celina Garfin, Donna Mae Gaviola, Dr. Allan Fabella and Team

Dr. Ma. Cecilia Ama, Dr. Ramon Basilio, Ma. Cecilia Serrano and Team

Dr. Rajendra Yadav