Care pathways, and care delays among sputum positive pulmonary tuberculosis patients attending District Chest Clinics in Sri Lanka

1. Background and justification

Worldwide, TB is one of the top 10 causes of death and the leading cause from a single infectious agent (above HIV/AIDS). Millions of people continue to fall sick with TB each year. In 2017, TB caused an estimated 1.3 million deaths (range, 1.2–1.4 million) among HIV-negative people and an additional 300 000 deaths (range, 266 000–335 000) among HIV-positive people (WHO-TB Global report, 2018). It was estimated that around 10.0 million people (range, 9.0–11.1 million) developed TB disease in 2017, globally: 5.8 million men, 3.2 million women and 1.0 million children. There were cases in all countries and age groups, but overall 90% were adults (aged ≥15 years), and 9% were people living with HIV (72% in Africa).

Despite many public health strategies implemented to combat TB disease, this remains as a major public health problem in many parts of the world, especially among low- and middle-income countries. The South East Asia (SEA) Region is the home to one fourth of the world's population; however, the region accounts for nearly half of the global burden in terms of new TB cases appearing each year. In 2015, there were an estimated 4.74 million new cases of TB and nearly 800 000 people died due to TB (and TB-HIV) in the region (WHO SEARO, 2017).

Although Sri Lanka is not a high burden country, TB remains as a major public health problem in the country. Number of TB cases notified remains static during last several years regardless of all the strategies adopted to address case detection, and active screening of high-risk groups. However, the number of notified TB cases was 8511 in 2017 compared to WHO estimates of 13,000 for the same year. This highlights that more than 4000 cases gap in TB case detection which marks up TB treatment coverage as 62%. Since 2011, this gap has widened as notifications have dropped from 10,329 (51.4 per 100,000 population) to 8,511 (39/100,000) in 2017 (NPTCCD,2017).

Timely diagnosis and treatment of TB cases is essential for TB control and prevention. The main aim to prevent the spread of the disease in the communities is to detect and treat new incident cases as early as possible (Long R., 2015, Pronyk, R.M 2001). Timely diagnosis largely depends on the suspicion made at the first contact point and therefore, the health providers at initial contact point play a major role in diagnosing TB. However, studies in several countries found that patients with chest symptoms usually go to the health facility late and also failure in health care staff to diagnose TB in populations with early classic symptoms.

Cough, which is a very common symptom among the majority of the population is the main symptom of TB. Unless it is linked with other symptoms, usually patients will not consider this as a priority health problem. Hence, patients experiencing TB symptoms may initially seek relief by using self-prescribed medication. Sometimes, even on consultation, the health care provider does not request TB investigations despite repeated visits, or it may go unnoticed in an overcrowded Out Patient Department (OPD) if the attending medical officer has not considered the differential diagnosis of tuberculosis. This would create a worst scenario if the health facility at first contact point will not serve the purpose of diagnosis and treatment. Sometimes, patients may go missing in the pathway or may be diagnosed at a later stage by the time the disease get advanced. Hence, the delays in health care seeking for TB related symptoms are observed due to both patient and provider factors. Therefore, identification of types of care providers in this regard is paramount.

The consequences for disease control at both the individual as well as the community level due to delay in diagnosis and treatment of TB is considerable. At individual level, a patient with a delayed diagnosis of TB would present with advanced disease stages thus worsening the treatment outcomes. At community level, infectious untreated patients would spread the disease among close contacts thus putting them in a risk situation. An untreated smear-positive TB case could infect approximately 15 people annually and therefore, delay in diagnosing and treating patients would promote continuous transmission making the scenario more complicated.

Timely diagnosis and treatment of TB patients is paramount to minimize TB related morbidity and mortality. Prompt treatment seeking of presumptive TB cases and early diagnosis by health care professionals and initiation of treatment, all necessary to overcome the challenge of TB burden in a country.

In Sri Lanka, patients have the option of choosing their own treatment seeking pathways, either public sector or private sector. Patients are opted to choose their service providers according to their convenience, preference and affordability. Hence, the first contact point of care would vary widely, and it would be an OPD of a government hospital, nearby private practitioner, OPD of a private hospital or a Specialist care provider. Sometime, patient tend to seek treatment from more than one treatment providers where the exact history of duration of cough may not revealed properly for the latter provider. Similarly, patients may take time to initiate treatment seeking as the presenting symptoms would not pause major physical health problems at the

beginning. Hence, the complex pathway of treatment seeking, and the delays of treatment seeking needs to be studied to plan interventions.

Initiation of treatment for all TB patients is done by the District Chest Clinics, the end point where a TB patient is registered for treatment. Therefore, the total care delay from the point of appearance of symptoms to initiation of TB treatment largely depend on the patient's knowledge and attitudes towards TB as well as the type of care providers that presumptive TB patients have chosen as first and subsequent contact points during the care pathway. This study would provide the correlates of delayed care seeking which need to be attended by the programme implementers for better outcome in future.

The country has moved forward in establishing diagnostic services by decentralizing the TB services beyond district chest clinics (NPTCCD 2016). The diagnostic and treatment services has been established in health care institutions to make treatment services accessible and affordable. The basis of this policy decision was to enhance detection of more incident cases as presumptive TB cases could be lost during the long and complex care pathways. However, the programme should be able to get an idea about whether these presumptive cases are visiting the centres with diagnostic facilities at the initial point to justify the service access. If majority of the patients are visiting to other facilities without services the National Programme should think a way to streamline the services properly to get the maximum output. Hence, to evaluate the policy decision of screening the presumptive TB cases in OPDs of government hospitals, this type of study is important.

This study was based on pulmonary TB which is infectious and has more impact on the community in terms of spread. Moreover, the main presenting symptom of pulmonary TB is cough, if persist more than two weeks should suspect TB. This has been the main slogan of TB control programme in Sri Lanka throughout.

2. Objectives

General objective:

To describe the care pathways and the care delays in health care seeking among sputum positive pulmonary tuberculosis patients attending District Chest Clinics

Specific objectives:

1. To describe the care pathways in health care seeking among sputum positive pulmonary tuberculosis patients
2. To assess TB service access at initial care seeking of the patient pathway
3. To describe the patient delay and health system delay up to the level of initiation of tuberculosis treatment among pulmonary tuberculosis patients
4. To assess TB service coverage by health facility level and sector

3. Methods

3.1 Study Design

The proposed study envisaged a cross sectional descriptive study design to achieve the objectives

3.2 Study setting

The study was conducted in **all 26 District Chest Clinics in Sri Lanka**. NPTCCD is the central organization that provides technical guidance for all the District Chest Clinics while only Colombo and Gampaha District Chest Clinics are administratively under NPTCCD.

3.3 Study period

The data collection was done from September 2019 to January 2020.

3.4 Study population

All new sputum positive pulmonary TB patients attending for registration for treatment at District Chest Clinics were recruited for the study. (Retreatment patients were not included in the study considering their previous treatment experience would affect the care pathway and care delay).

Inclusion Criteria:

Both the children, adolescents and adults registered for treatment **as "new sputum positive pulmonary TB patients"** were included in the study.

Exclusion Criteria:

Retreatment patients, the patients who cannot communicate rationally due to mental sub normality/psychiatric disorders were excluded from the study. Patients who were unable to give consent due to cognitive impairment or any other reasons were also excluded.

3.5 Sample size calculation

Median patient delay, health system delay and total delay were calculated during the study. Assuming the proportion of patients who seek treatment from Outpatient Department of state sector hospitals is 50%, the minimum sample size (n) required for the study was calculated using following formula,

$n = Z^2 \times p(1-p)/ d2$ (Lwanga & Lameshow, 1991)

Where n – Crude sample size

Z – Standard Normal Deviate (SND) for chosen confidence level

p – estimated proportion of presumptive TB patients visited to OPDs in state hospitals

d – level of desired absolute precision

At 95% level of absolute precision,

Z = 1.96

p = 0.50 (50%)

d = 0.035 (3.5%)

The sample size required was 800 subjects. When adjusted for a 10% non-response rate, the final sample size required to be interviewed was 880 patients. When rounded up the total sample size that needed to interview was around 900.

3.6 Sampling

Sampling was done according to the proportion of patients reported by all 26 DCC during the year 2018. The proportion of patients diagnosed in each chest clinics remained more or less similar over the years. The highest proportion (25%) was reported from Central Chest Clinic Colombo. This is a more rational subject selection compared to district population as case finding activities in each district differ according to many reasons including logistics. Therefore, division according population may allocate higher targets to some districts which may not be possible to collect within the time frame. Total number of patients allocated for Colombo district was further subdivided to Central Chest Clinic Colombo, branch clinic at Colombo South Teaching Hospital and Awissawella by considering the total number of patients reported during the year 2018. Consecutive sampling was carried out based on smear positive pulmonary TB patients who got registered as **new patients**.

3.7 Study Instruments

Data collection was done using two questionnaires.

1. An interviewer administered questionnaire, where information was obtained through face to face interviews was used for data collection. The questionnaires were administered both in Sinhalese and Tamil languages. The questionnaires were developed in English and then translated to Sinhalese and Tamil followed by back translation to English to assess the retention of the original meaning.

The Questionnaire was comprised of two main components

Component 1 – Patient information (This includes several sections; A – contact details, B- Sociodemographic Information, C- contact history, co-morbidities and lifestyle factors, D- Knowledge/Attitude and Practices towards TB)

Component 2 – Care Pathway Analysis (Section A – General Questions, B- Care Pathway and Care delay)

2. Instrument on extraction of data on service availability at different facility level- This questionnaire included data extraction sheet to collect information on service availability in health facilities.

3.8 Training of data collectors and data collection

Data collection was done by the PHII at District Chest Clinics. This reduced the language barriers specific to each area. An interviewer guide was prepared. Based on the guide, data collectors underwent a training where the research was explained and the questionnaire was discussed in detail, including what information needed to be obtained from the participants and the registers. Importance of maintaining privacy for contact information was explained to them. The communication methods and the obtaining the informed consent was also emphasised. The importance of maintaining courtesy, respect and patience while obtaining information from the patients was explained. The data collectors were regularly supervised by the investigators to ensure the necessary information was obtained in the correct manner. Data on service availability in health facilities in the district was collected by the District Tuberculosis Control Officer (DTCO).

The data collectors (PHII) recruited new patients who were registered for the initiation of treatment. After introducing themselves and the objective of the study, and the benefits to the community, data collectors provided the information sheet to all the participants and explained the purpose of the study. Informed consent of the participants was taken after explaining the objectives and probable outcomes of the study. For children, parental consent was taken. Explanation in the native language improved the understandability and prior to signature all the participants were inquired whether they have understood the procedures. The informed written consent from the participants was taken thereafter. Face to face interviews were

conducted in a quiet area allocated for the same purpose after the patient completed registration procedures.

Patients were given the option to volunteer to participate in this study. Subjects had the opportunity to ask questions and inquire about the study questions, and also, they had the freedom to step down from the interview at any time or refrain from answering any question they might not wish to respond to.

DTCOs collected the service availability at different health facility in their own district.

3.9 Data analysis

We used SPSS statistical software to analyse the data. Univariate data analysis was done to provide descriptive information on the proportion of patients visited each type of care providers, the median delay ± IQR, service coverage and service access.

3.10 Ethical and Administrative Requirements

The ethical clearance was obtained from the Ethical Review Committee of the Faculty of Medicine, University of Sri Jayawardanapura, Sri Lanka for the conduct of this study.

Prior to the study, permission was obtained from the Director General of Health Services of the Ministry of Health, Director National Tuberculosis Control Programme and the respective Regional Directors of Health Services and officer in-charge of each District Chest Clinic.

3.11 Definition of the variables

Pulmonary tuberculosis (PTB) - TB involving the lung parenchyma or the tracheobronchial tree with or without the involvement of any other organs in the body. This will include both sputum positive PTB and clinically diagnosed (sputum negative but Xray suggestive)

New Pulmonary tuberculosis (PTB) – A TB patient who has never taken treatment for TB or taken treatment previously for less than one month

Figure 1 and 2 denotes the schematic representation which facilitate definitions of rest of the variables.

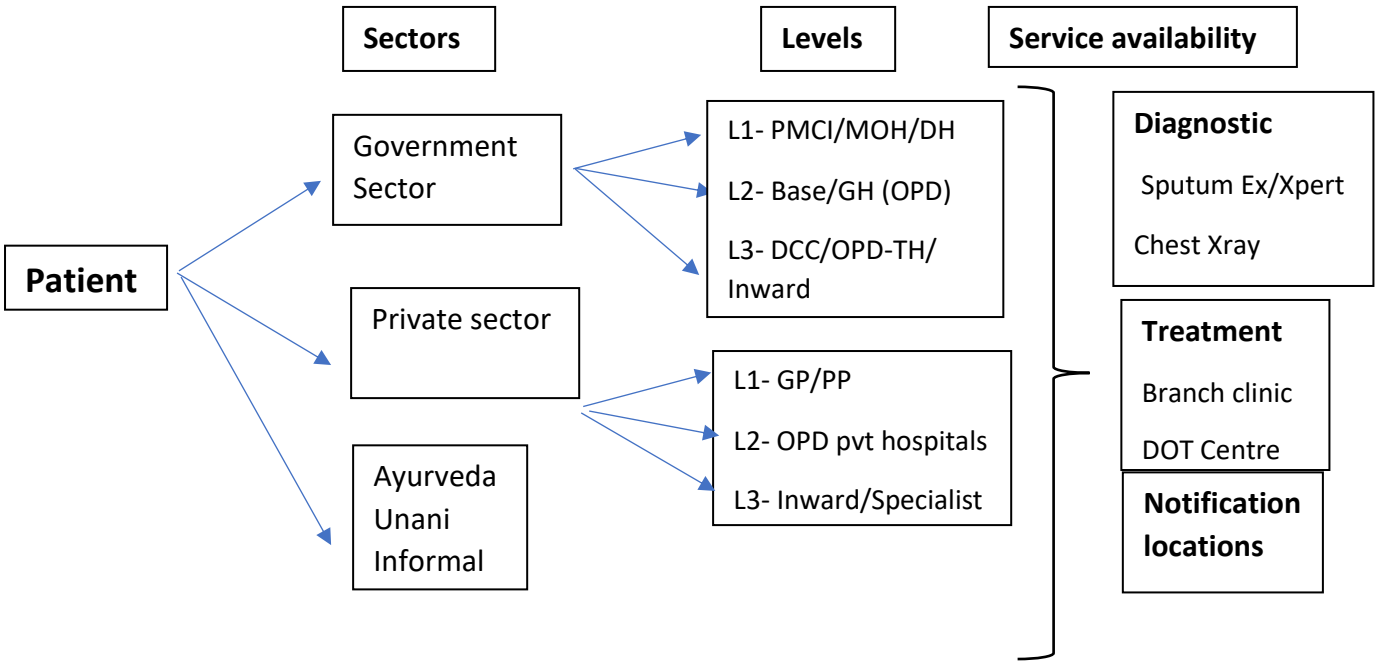


Figure 01: Schematic representation of facilities and service availability at initial contact point by sector

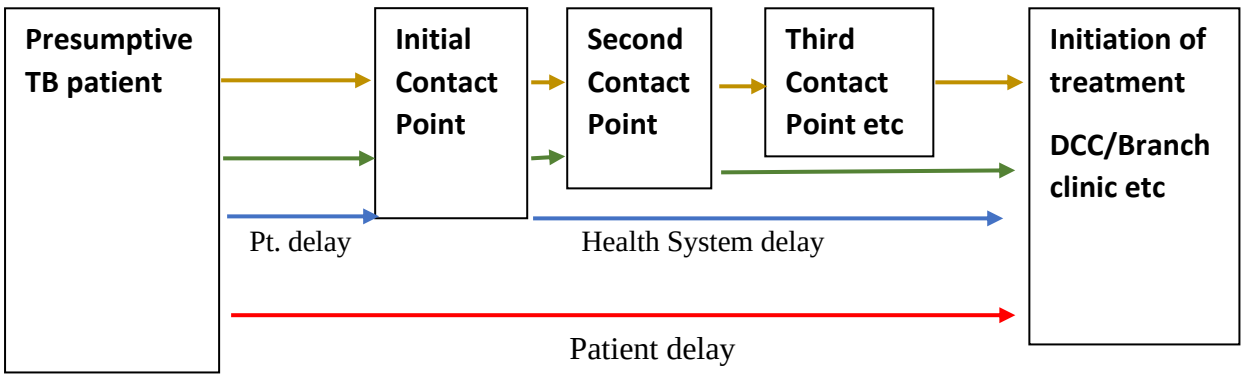


Figure 02: Schematic representation of "Patient Delay" and "Health System Delay" in relation to care pathways

1. **Care pathway-** the pattern of care seeking from the onset of the symptoms until initiation of treatment at District Chest Clinics (1st contact point, 2nd contact point etc)
2. **Initial Care seeking-** The proportion of patients who initiate care, by facility level and sector
3. **TB service coverage was analysed as diagnostic and treatment coverage-** Proportion of health facilities that provide TB services (diagnostic/treatment and notification) out of all health facilities by each sector and level. This will be analysed under following categories.
    - **Diagnostic coverage-** The proportion of health facilities with tuberculosis diagnostic services by facility level and sector
    - **Treatment coverage-** The proportion of health facilities with anti-tuberculosis medicines or that supervise tuberculosis patients during treatment, by facility level and sector
4. **TB service access at initial care seeking-** The proportion of patients who initiate care in a facility with tuberculosis services**.** This was analysed under following categories.
    - **Diagnostic access-** The proportion of patients who initiate care in a facility with tuberculosis diagnostic services
    - **Treatment access-** The proportion of patients who initiate care in a facility with tuberculosis treatment services
5. **Patient delay-** the time between appearance of symptoms and the initial consultation with any health care professional (private/public/Ayurvedic/Unani)
6. **Health system delay-** the time between first consultation with any health care professional (private/public/ayurvedic/Unani) and the initiation of proper TB treatment

3. Results

- Response rate- 743/880= 93%
- Median age – 51years (IQR:25; range 13-88years)

Table 1. Distribution of patients by age categories

Age category	Number	%
0-14	13	1.7
15-24	67	9.0
25-34	83	11.2
35-44	111	14.9
45-54	144	19.4
55-64	181	24.4
65 and above	144	19.4
Total	743	100

Table 2. Distribution of patients by gender

Gender	Number	%
Male	507	68.4
Female	236	31.6
Total	743	100

Figure 1. Distribution of patients by age and gender

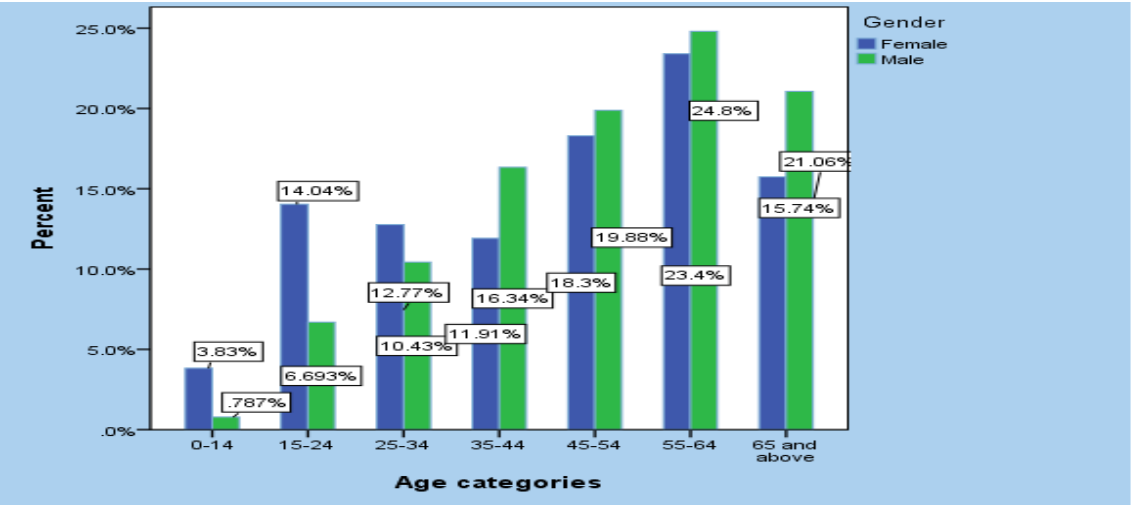


Figure 2. Distribution of patients by type of residence

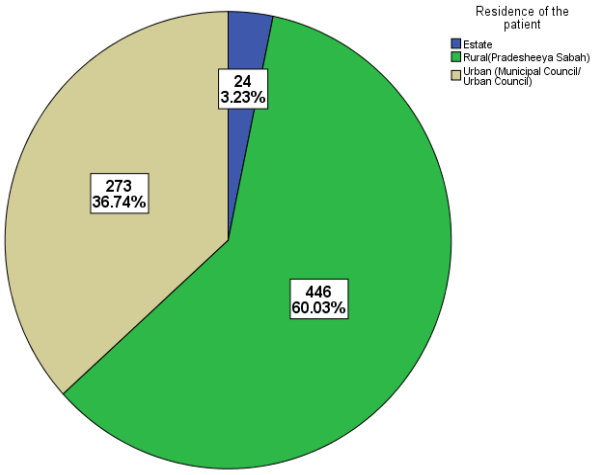


Table 3. Distribution of patients by ethnicity

Ethnicity	Number	%
Sinhala	477	64.2
Tamil	155	20.9
Moor	111	14.9
Total		

Table 4. Distribution of patients by religion

Gender	Number	%
Male	507	68.4
Female	236	31.6
Total	743	100

Table 4. Distribution of patients by marital status

Marital status	Number	%
Students and children	20	2.7
Unmarried	107	14.4
Married	578	77.8
Widowed	22	3
Separated	12	1.6
Divorced	04	0.5
Total	743	100

Table 5. Distribution of patients by marital status

Level of education	Number	%
No schooling	31	4.3
Grade 1-5	200	27.7
Grade 6-11(up to/passed O/L)	381	52.7
Grade 12-13 (up to/passed A/L)	90	12.4
Diploma/Degree	19	2.6
Postgraduate qualifications	2	0.3
Total	723	100

Table 6. Distribution of patients by marital status

Status of occupation	Number	%
Currently working	311	43
Currently not working	412	57
Total	723	100

Table 7. Distribution of patients by type of occupation

Type of occupation	Number	%
Senior Officials & Managers	6	1.9
Armed Force Occupations	13	4.2
Professionals eg. Teachers, HCW	34	10.9
Technical & Associate Professionals	18	5.8
Clerks/ and clerical support workers	17	5.5
Services and sales workers	57	18.3
Skilled, agricultural, forestry and fishery workers	16	5.1
Craft and related trades workers	17	5.5
Plant and machine operators and assemblers	9	2.9
Elementary occupations	124	39.9
Total	311	100

Table 8. Distribution of patients by family income

Level of income	Number	%
<10,000	138	18.6
11,000-20,000	185	24.9
21,000-30,000	139	18.7
31,000-40,000	126	17.0
41,000-50,000	94	12.7
51,000-60,000	36	4.8
>60,000	25	3.3
Total	100	100

Distribution of patients by Family type and size

During the initial period of the illness, 648 (87.2%) patients lived with their families. Of this 592 (91.3%) had a nuclear family structure while 56 (8.7%) had an extended family structure

Average family size, mean 3.8; median 4.00 (IQR 2, range 1-12)

Table 9. Distribution of patients by number of family members in the household

Number of family members	Number	%
1 member	47	7.3
2 members	81	12.5
3 members	157	24.2
4 members	174	26.9
5 members	97	15.0
6 members	57	8.8
7 members	21	3.2
8 or more	14	2.1
Total	648	100

Table 10. Distribution of patients by risk factors

Type of risk factor	Yes (%)	No (%)
Hx of working as HCW	21 (2.8)	722 (97.2)
Contact Hx of TB	127 (17.1)	No-430 (57.9), Don't know 186
Comorbidity- DM	213 (28.7)	530 (71.3)
Comorbidity- CKD	11 (1.5)	732 (98.5)
Comorbidity- BA	34 (4.6)	709 (95.4)
Comorbidity- Psychiatric illness	29 (3.9)	714 (96.1)
Current use of alcohol	241 (32.4)	502 (67.6%)
Use of illicit drug	41 (5.5)	702 (94.5)
Tobacco use	229 (30.8)	514 (69.2)
Currently under imprisonment	19 (2.5)	724 (97.5)

Distribution of patients by presentation of symptoms

Majority, (n= 676, 91%) of the patients mentioned that cough was the first symptom to appear. Of this, 283 (42%) patients said that cough was associated with fever. Around 21 patients (2.8%) declared that the illness started with haemoptysis whereas rest (n=46, 6.2%) of the patients mentioned shortness of breath as the first symptoms.

Table 11. Proportion and duration of respective symptoms when the patients first presented to a health care worker

Symptom	Number (%)	Median duration and IQR
Cough	706 (95%)	21 days (IQR: 16days, range 2 to 730 days)
Fever	458 (61.6%)	14days (IQR: 12days, range 1day to 180 days)
Night sweats	145 (19.5%)	13 days (IQR: 14days, range 2days to 90 days)
Loss of appetite	409 (55%)	21days (IQR: 16days, range 3days to 340 days)
Loss of weight	229 (30.8%)	30 days (IQR: 28days, range 5days to 365 days)
Fatiguability	171 (23%)	30days (IQR: 46days, range 3days to 180 days)
Shortness of breadth	231 (31.1%)	14 days (IQR: 23days, range 1day to 720 days)
Haemoptysis	76 (10.2%)	3days (IQR: 6days, range 1day to 18 days)
Chest pain	147 (19.8%)	14days (IQR: 23days, range 1day to 189 days)

Patient pathway analysis

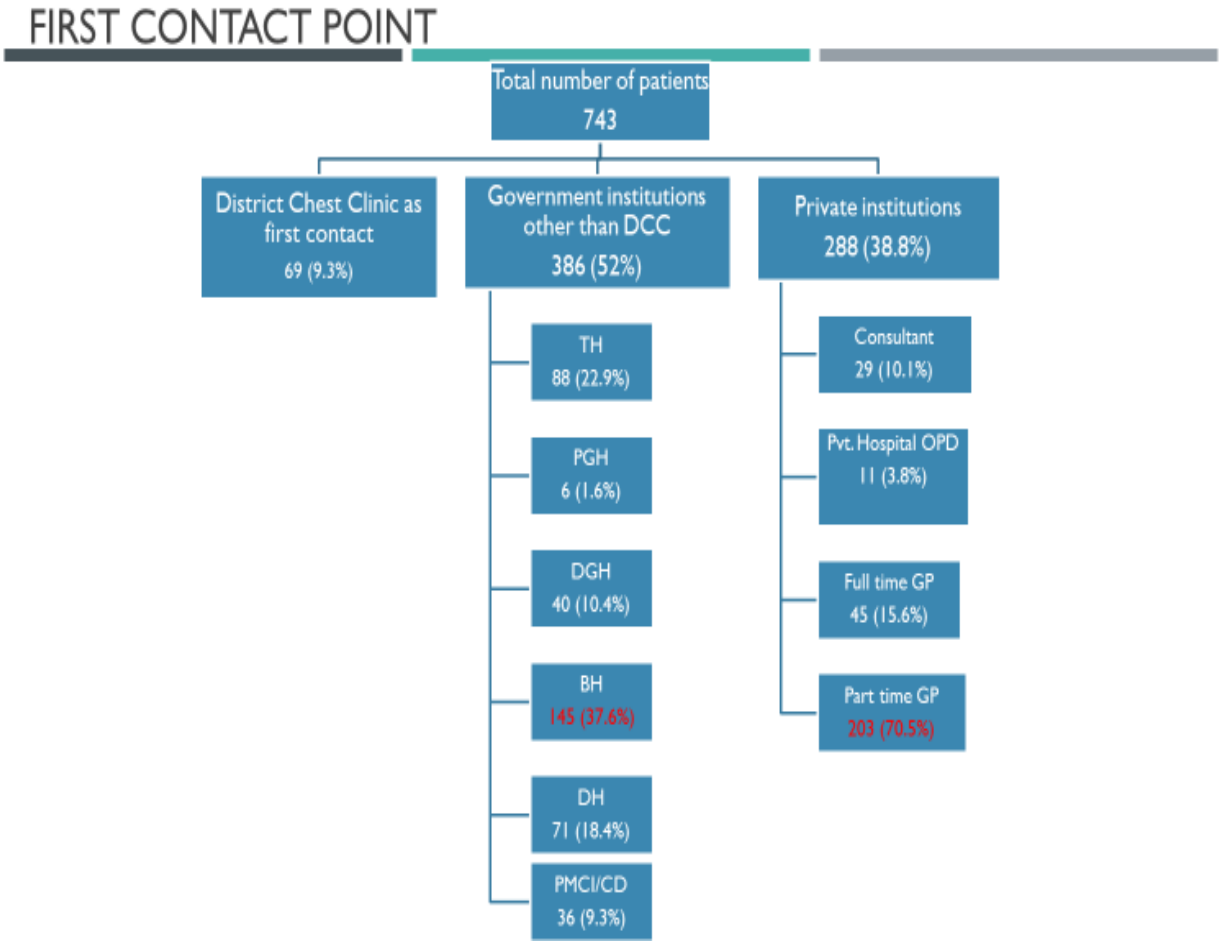


Table 12. Reasons for attending government institutions

Reasons	Number (%)
The institution is closer to my home	255 (66.1%)
I have more trust on government sector	89 (23.1%)
Cannot afford for private sector	18 (4.7%)
Attending routine clinic in that hospital	15 (3.9%)
Convenient	4 (1%)
I know people working in that institution	3 (0.7%)
There are more facilities	2 (0.5%)
Total	386 (100%)

Table 13. Reasons for attending private sector institutions

Reasons	Number (%)
Convenient	122 (42.4%)
Always go to my family doctor	107 (37.2%)
Always go to a Consultant	11 (3.8%)
The institution I visited is close by	34 (11.8%)
I have more trust on private sector	14 (4.9%)
Total	288 (100%)

ANALYSIS OF PATIENT PATHWAY OF THE PATIENTS WHO FIRST ATTENDED DISTRICT CHEST CLINIC (N=69)

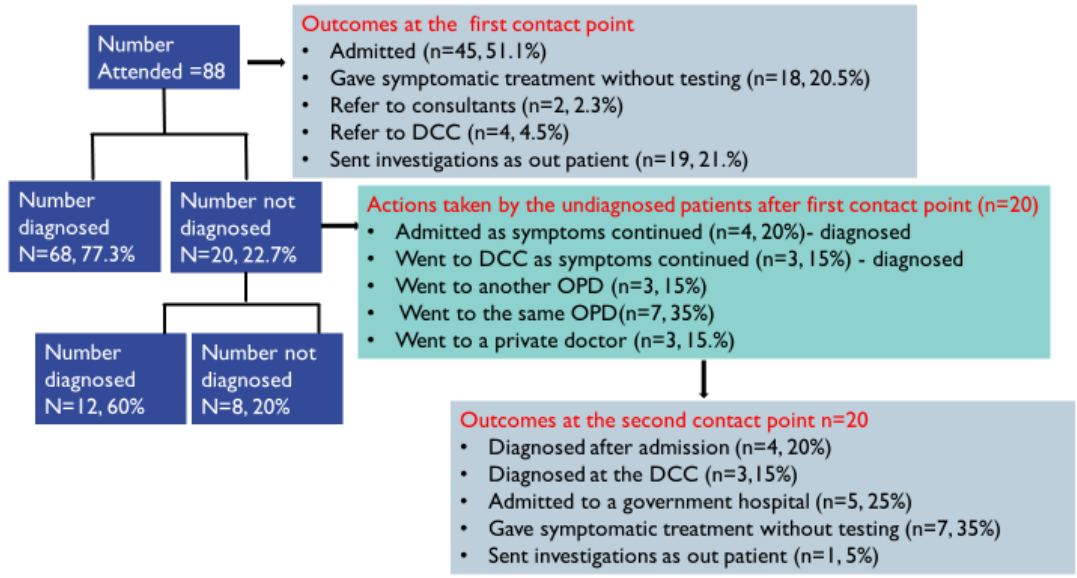
OUTCOME OF PATIENTS WHO FIRST VISITED DCC

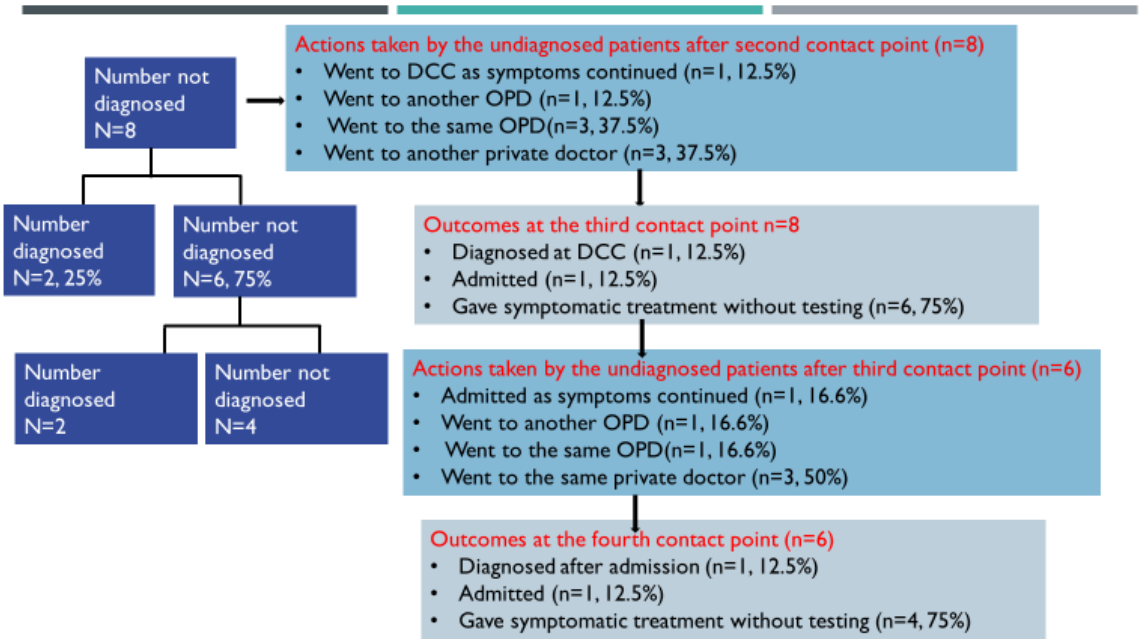
- Of the total, 2.3% (n=17) was routine clinic patients.
- Majority of the patients (n=53, 76.8%) had two visits before diagnosis
- 1 vist- 8.6%
- 2 visits 76.8%
- 3 visits – 8.6%
- 4 visits – 2.9%
- More than 4 visits- 3.0%
- Majority of the patients (n=52, 75%) were started treatment on the same day of the diagnosis

ANALYSIS OF PATIENT PATHWAY OF THE PATIENTS WHO FIRST ATTENDED GOVERNMENT INSTITUTIONS OTHER THAN DISTRICT CHEST CLINICS (N=386)

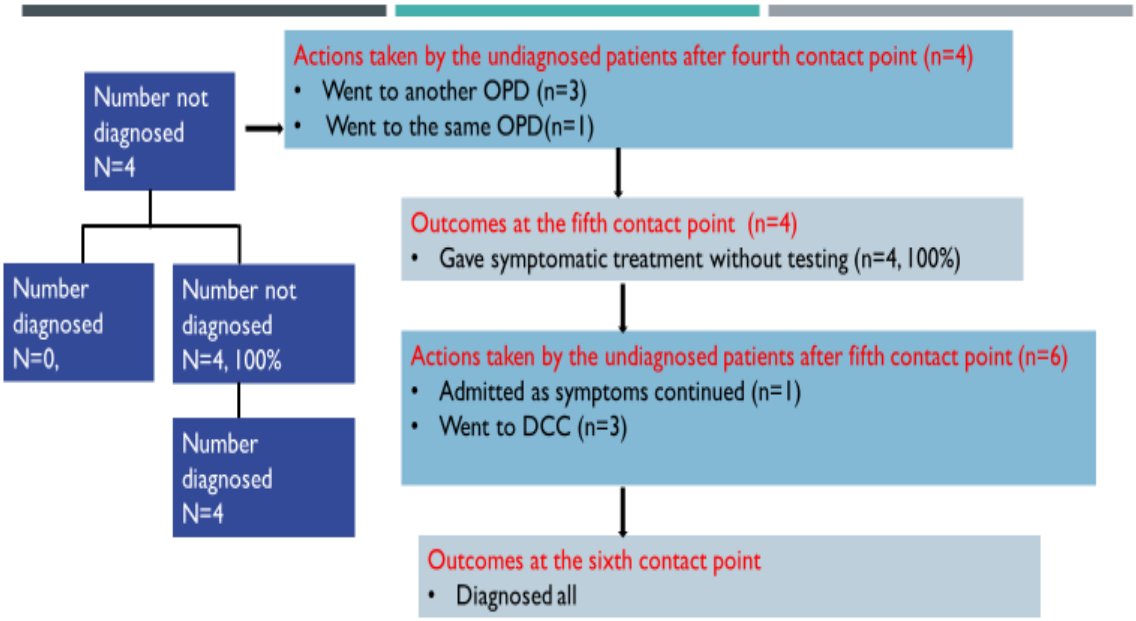
A. OUTCOME OF THE PATIENTS WHO FIRST VISITED TEACHING HOSPITALS (N=88)

- Around 96.6% (n=85) of the patients first visited to OPD and 3.4% (n=3) visited the clinic.

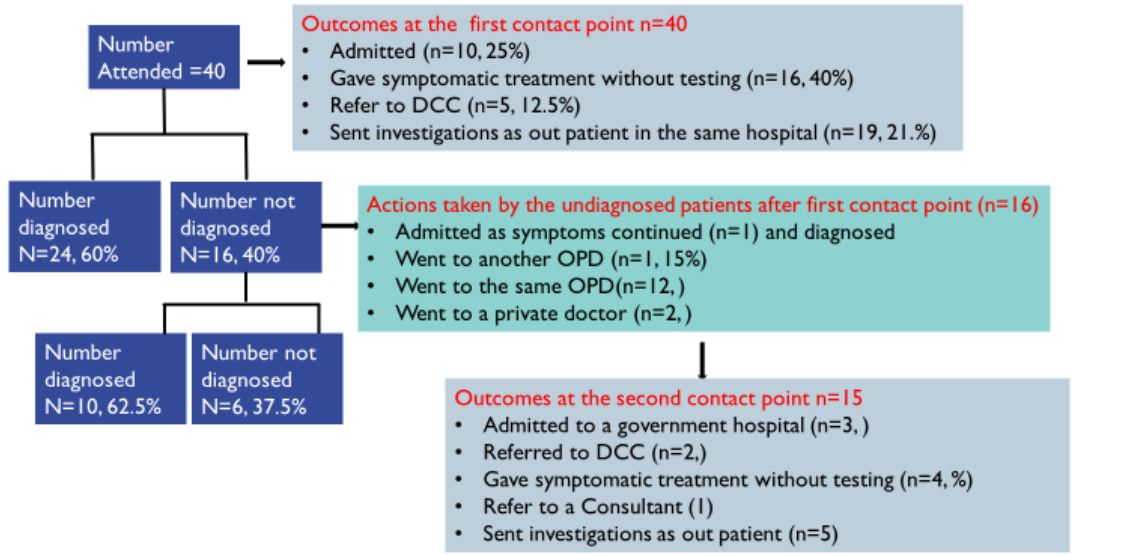


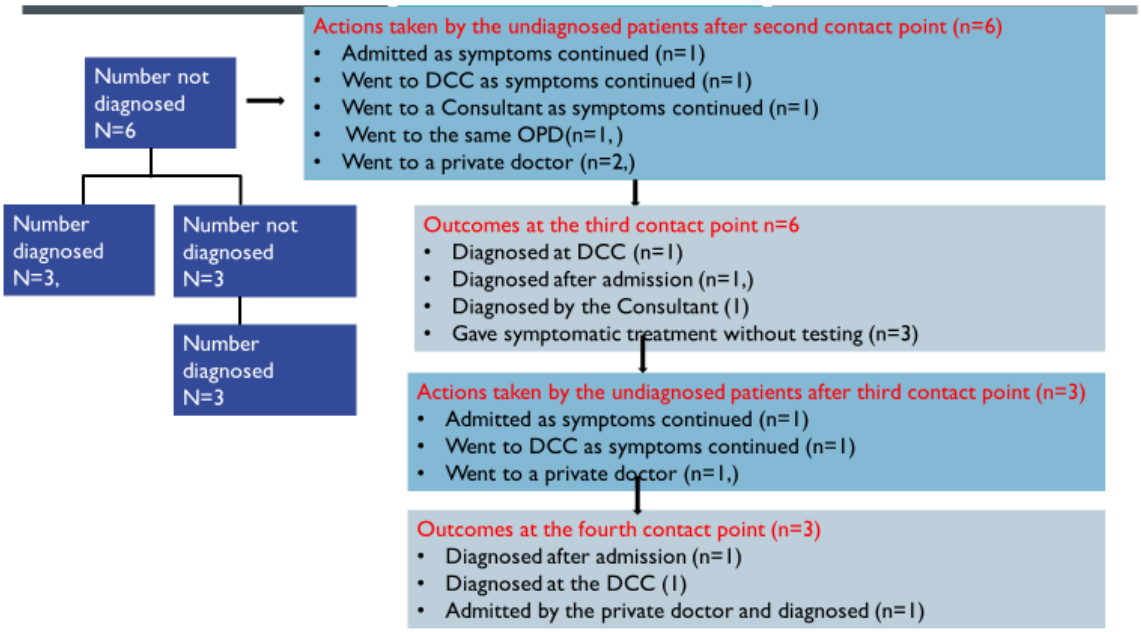


B. OUTCOME OF THE PATIENTS WHO FIRST VISITED PROVINCIAL GENERAL HOSPITAL (N=6)

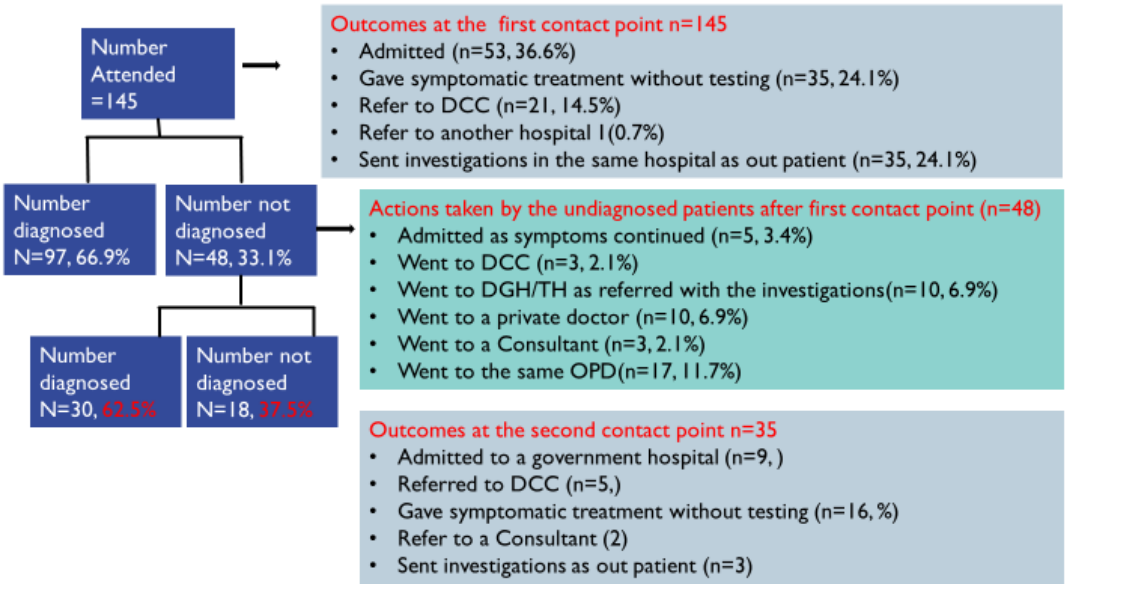


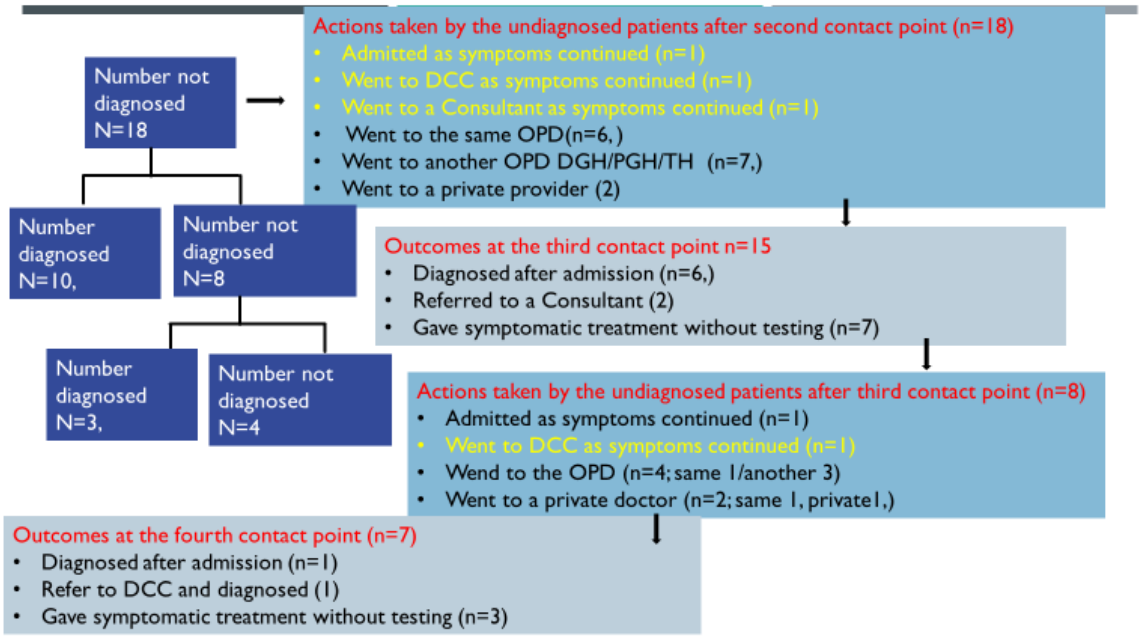
C. OUTCOME OF THE PATIENTS WHO FIRST VISITED DISTRICT GENERAL HOSPITAL (N=40)





D. OUTCOME OF THE PATIENTS WHO FIRST VISITED BASE HOSPITAL (N=145)





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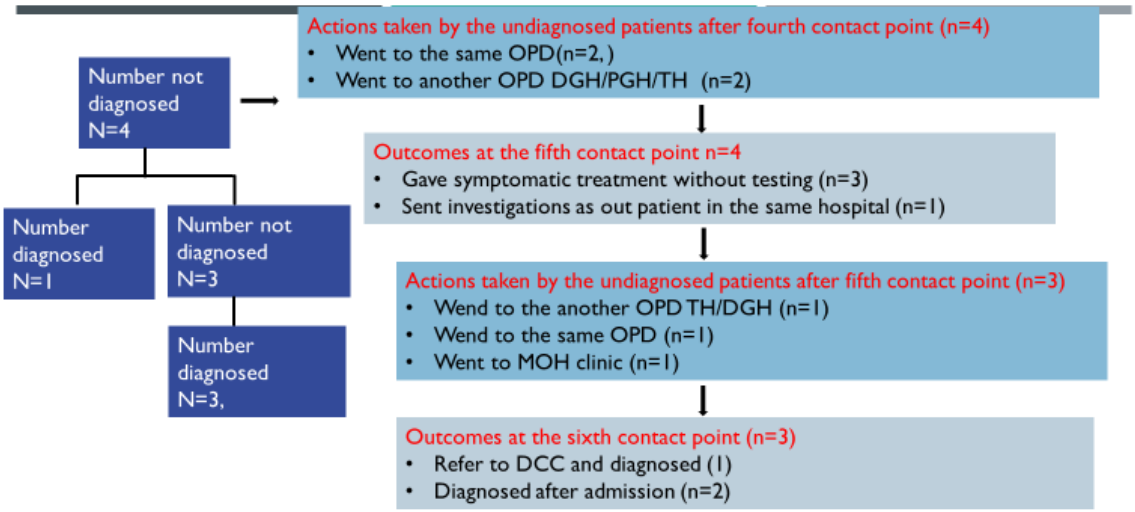
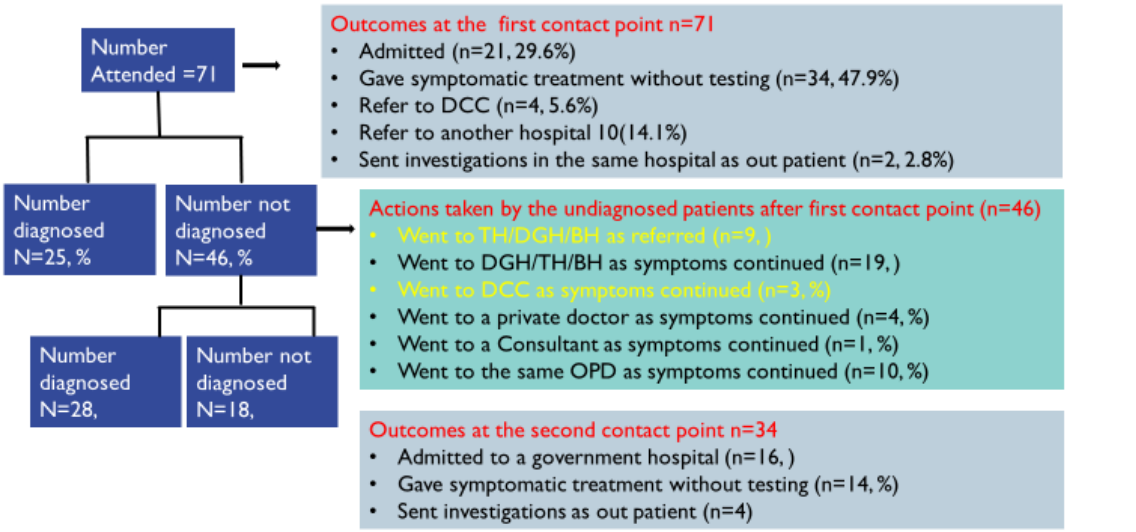
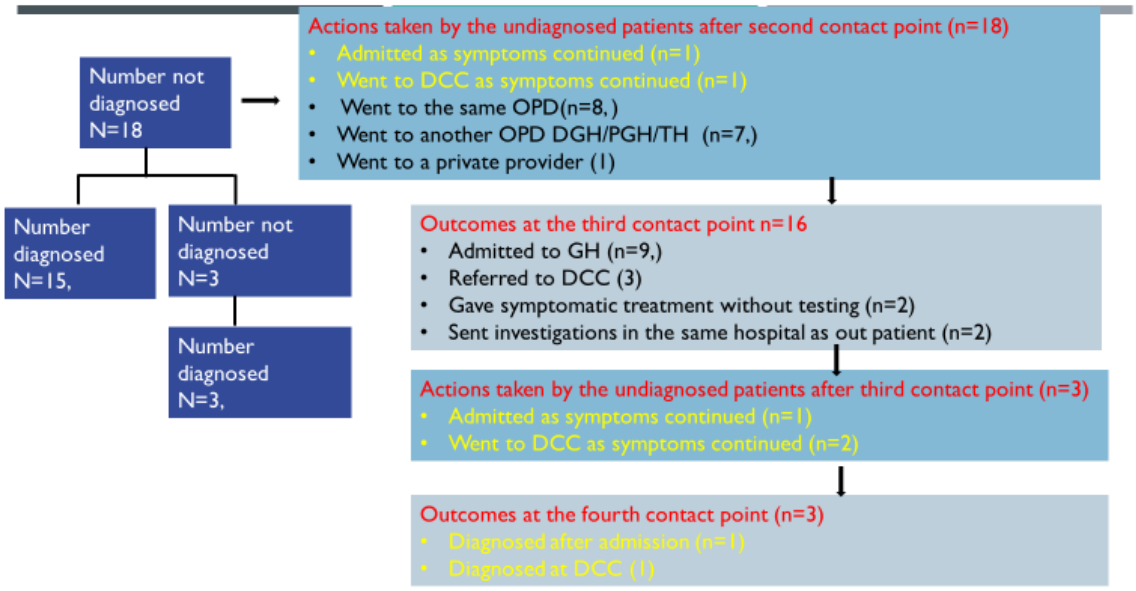
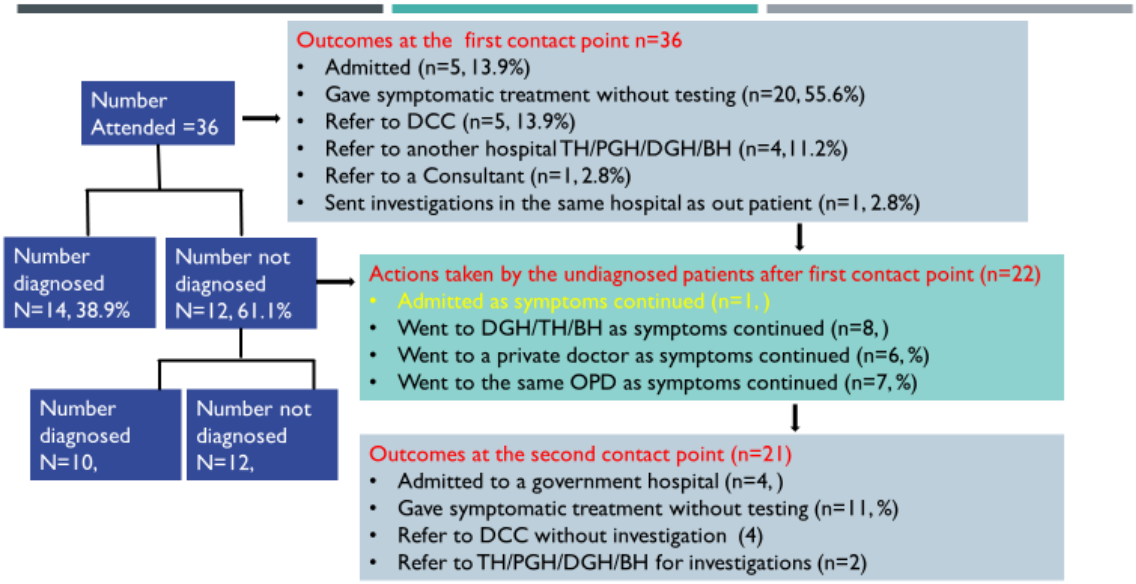


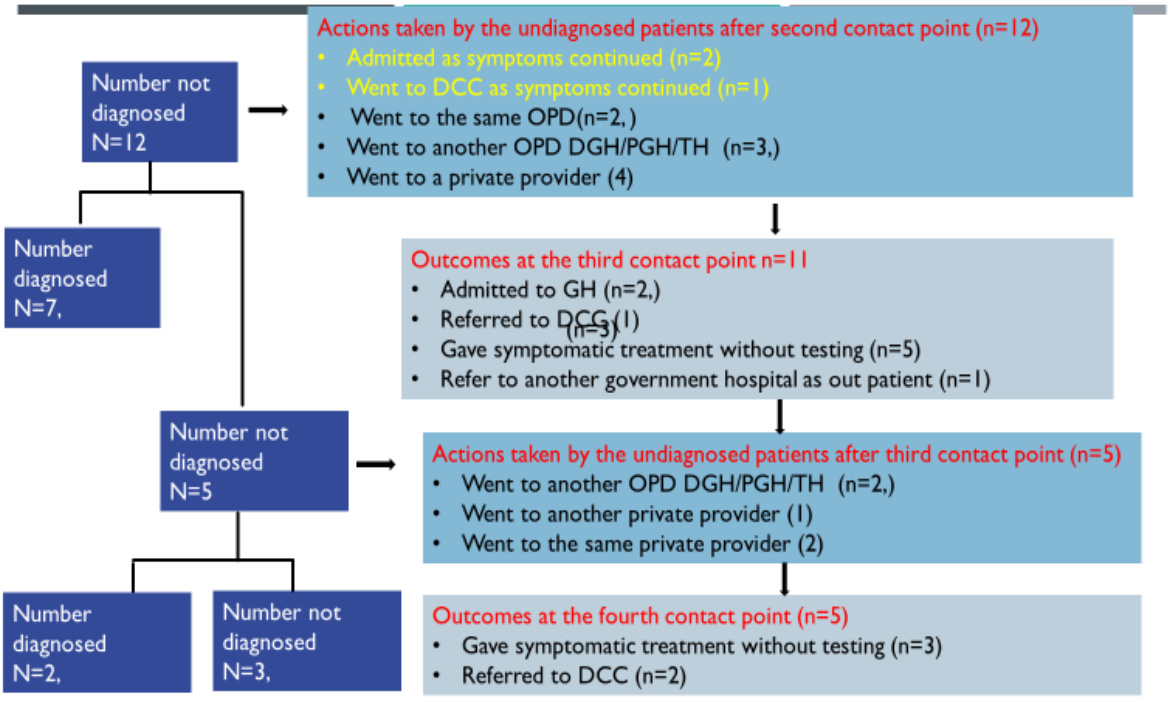
E. OUTCOME OF THE PATIENTS WHO FIRST VISITED DISTRICT HOSPITAL (N=71)

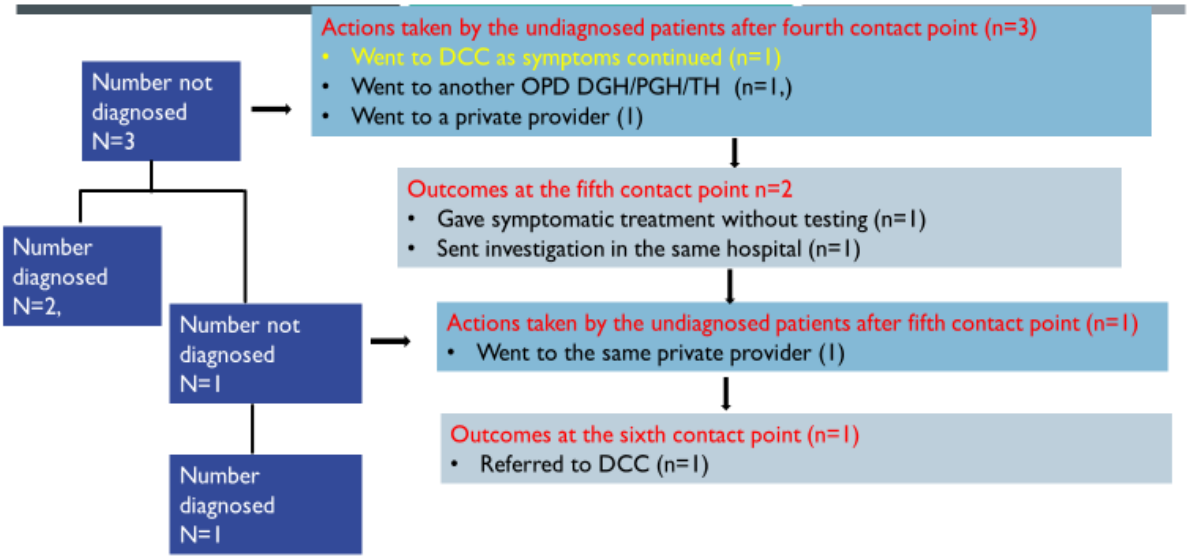




F. OUTCOME OF THE PATIENTS WHO FIRST VISITED CD/PMCI (N=36)

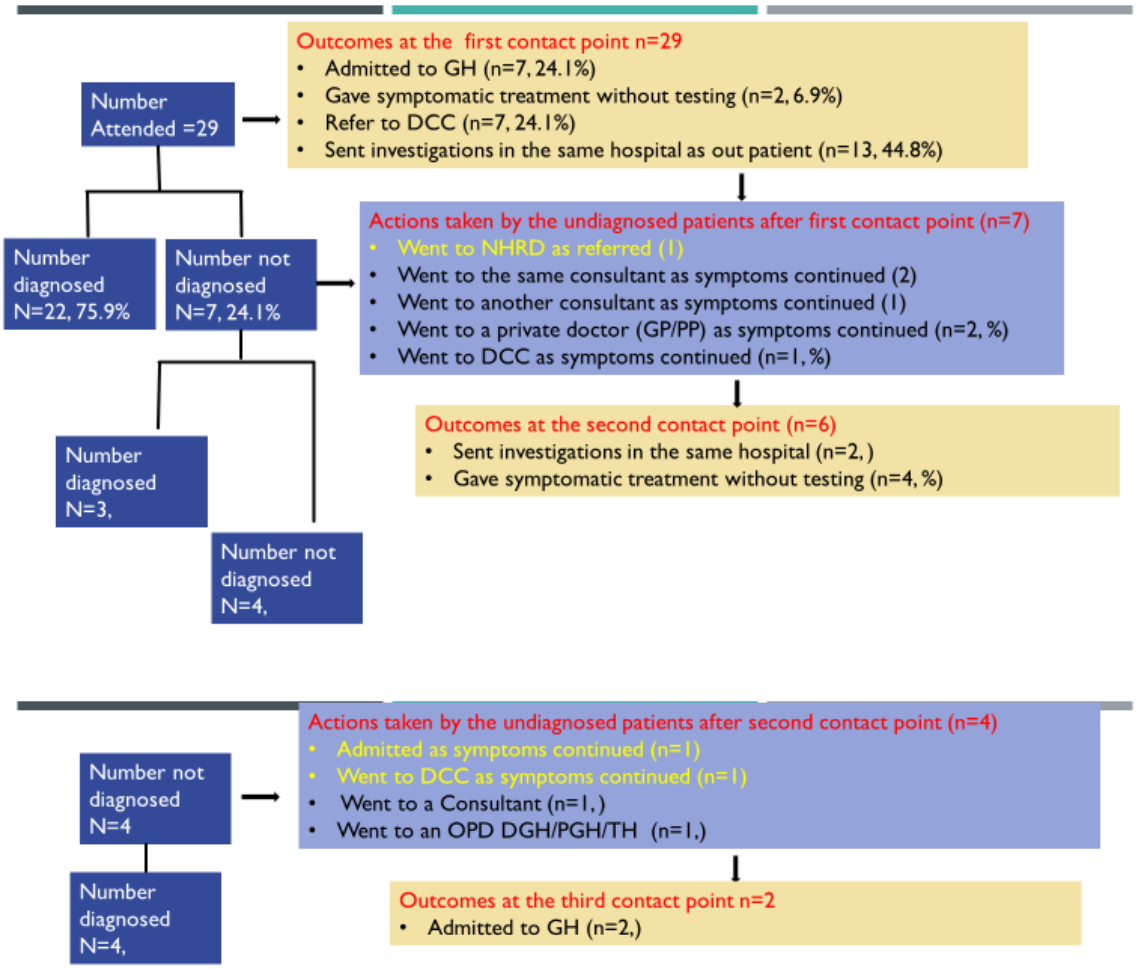




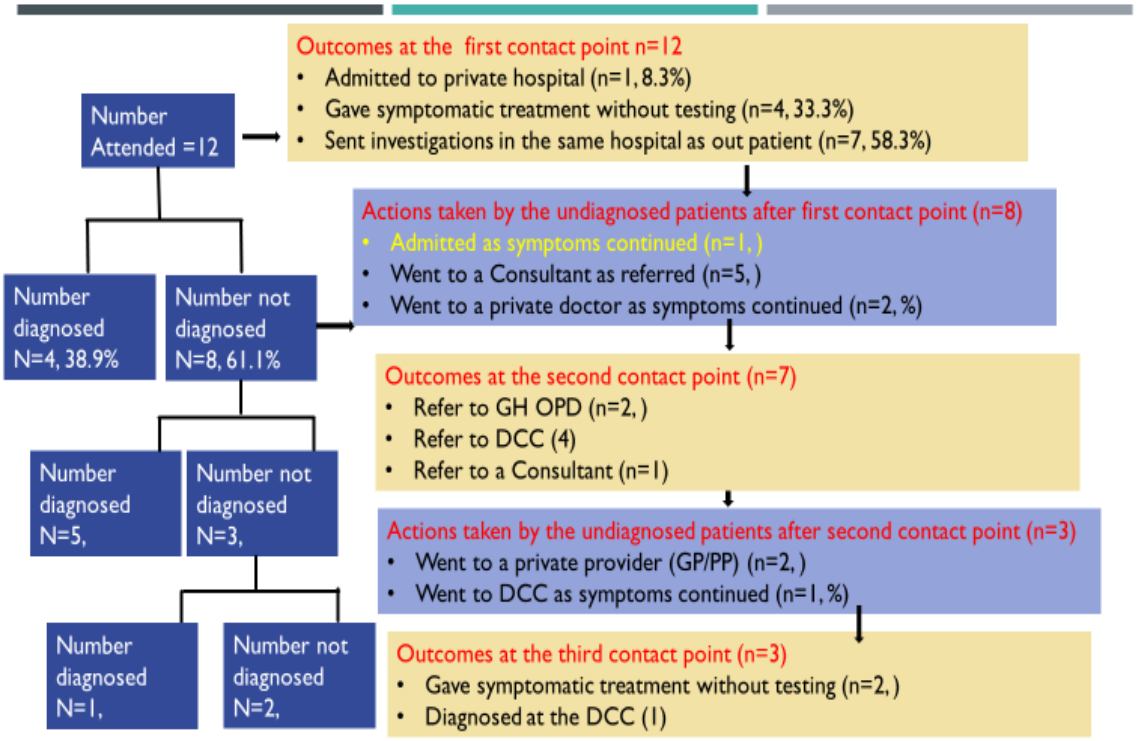

Number not diagnosed N=3
Actions taken by the undiagnosed patients after fourth contact point (n=3)
• Went to DCC as symptoms continued (n=1)
• Went to another OPD DGH/PGH/TH (n=1,)
• Went to a private provider (1)
Outcomes at the fifth contact point n=2
• Gave symptomatic treatment without testing (n=1)
• Sent investigation in the same hospital (n=1)
Number diagnosed N=2,
Number not diagnosed N=1
Actions taken by the undiagnosed patients after fifth contact point (n=1)
• Went to the same private provider (1)
Outcomes at the sixth contact point (n=1)
• Referred to DCC (n=1)
Number diagnosed N=1

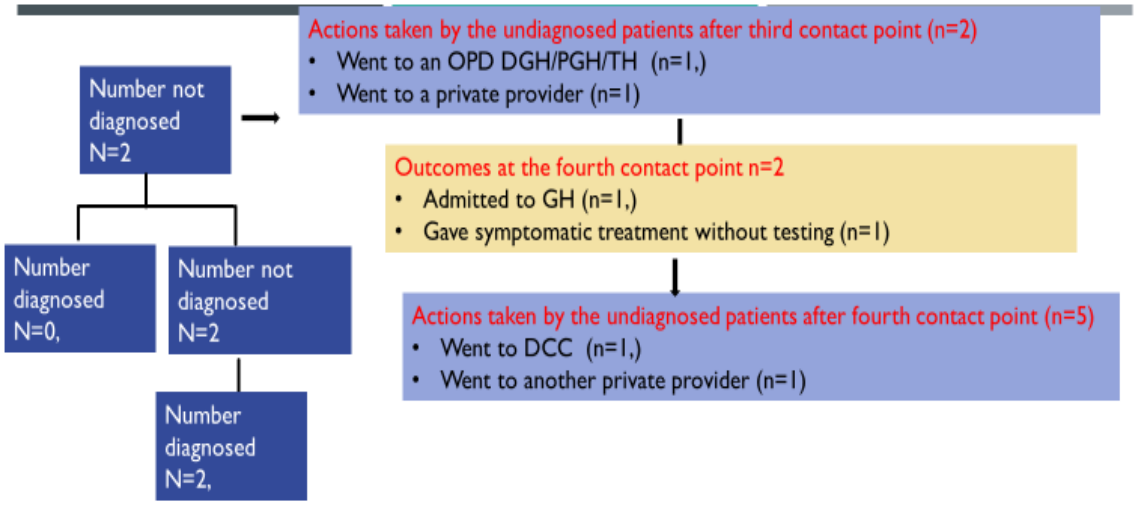
ANALYSIS OF PATIENT PATHWAY OF THE PATIENTS WHO FIRST ATTENDED PRIVATE SECTOR INSTITUTIONS (N=288)

A. OUTCOME OF THE PATIENTS WHO FIRST VISITED PRIVATE CONSULTANTS (N=29)

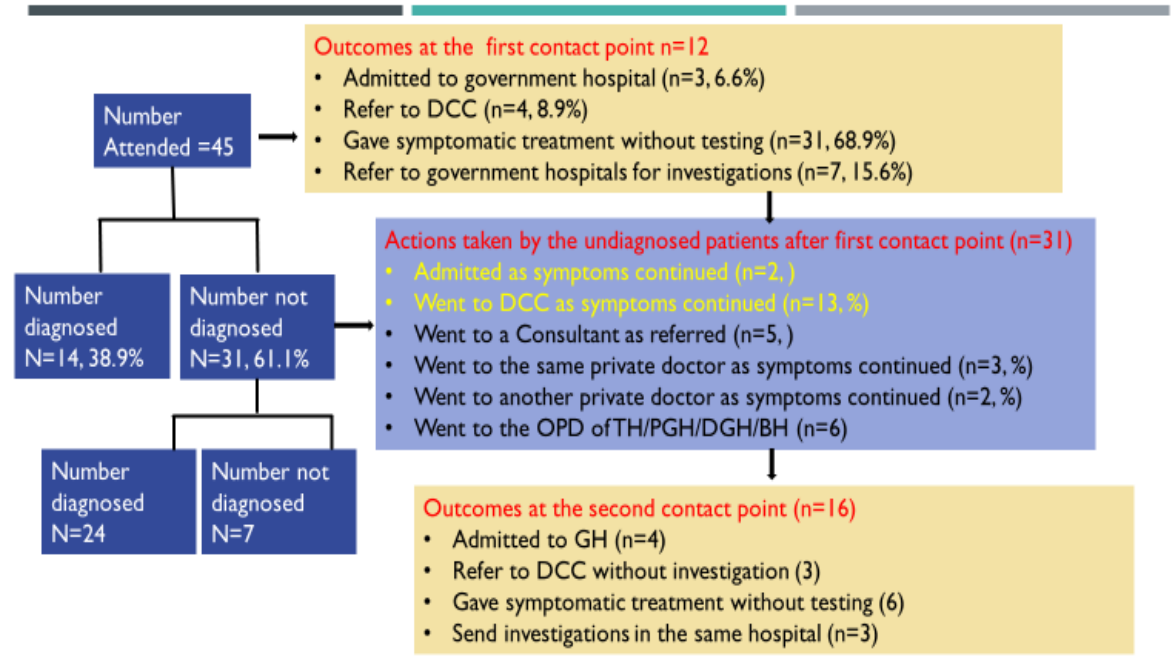


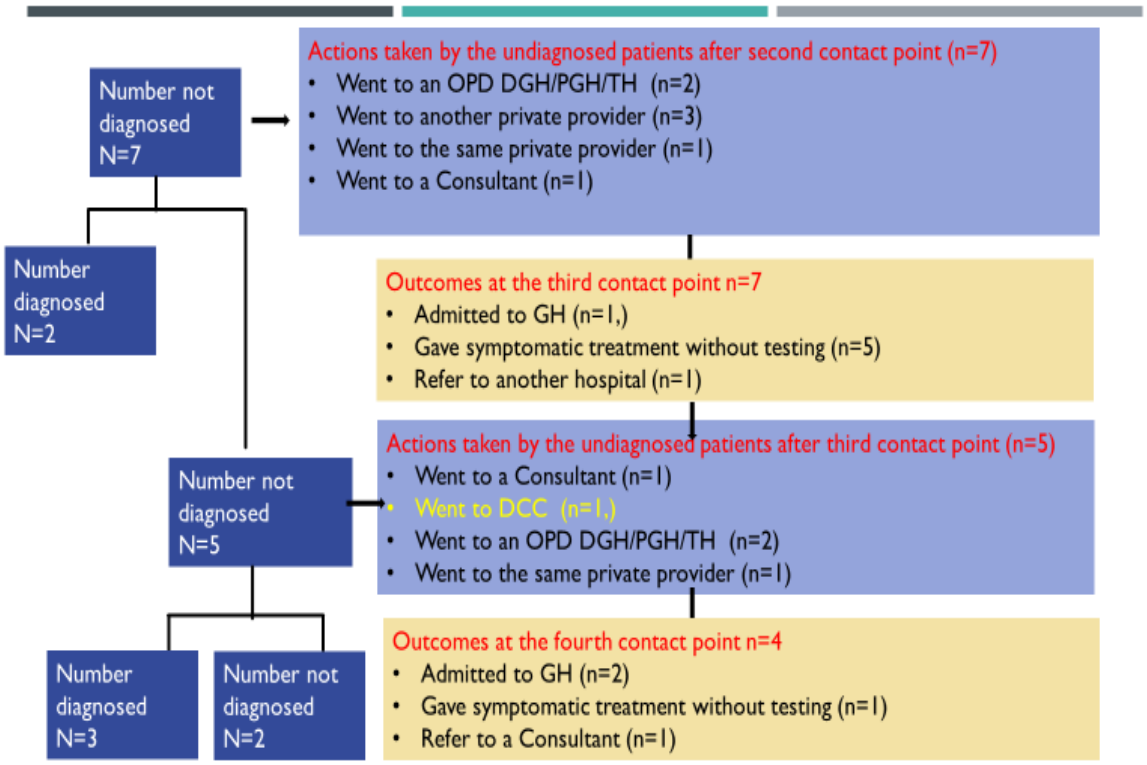
B. OUTCOME OF THE PATIENTS WHO FIRST VISITED PRIVATE HOSPITALS (N=12)

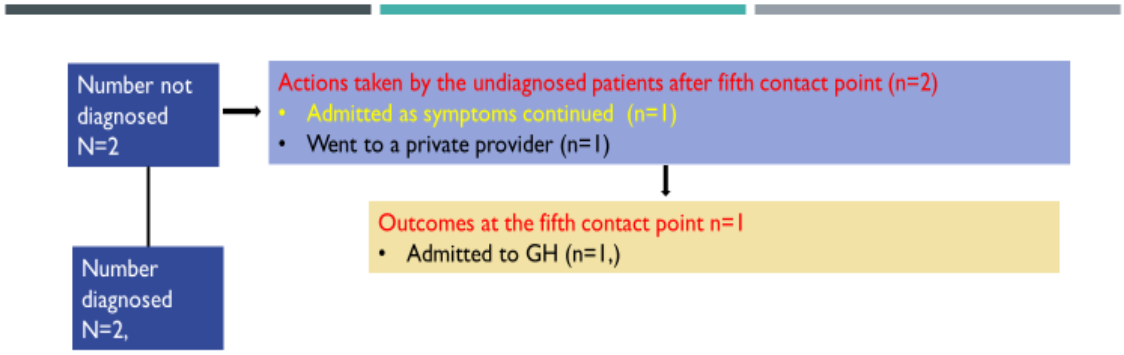




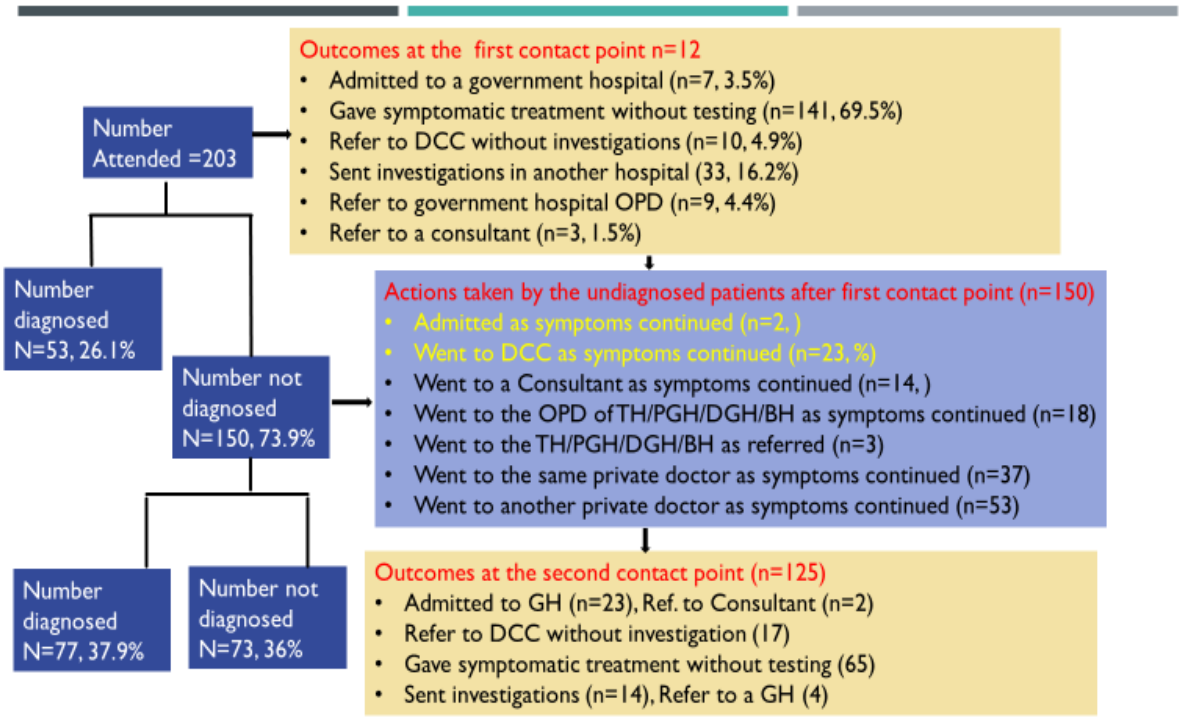
C. OUTCOME OF THE PATIENTS WHO FIRST VISITED GENERAL PRACTITIONER (N=45)

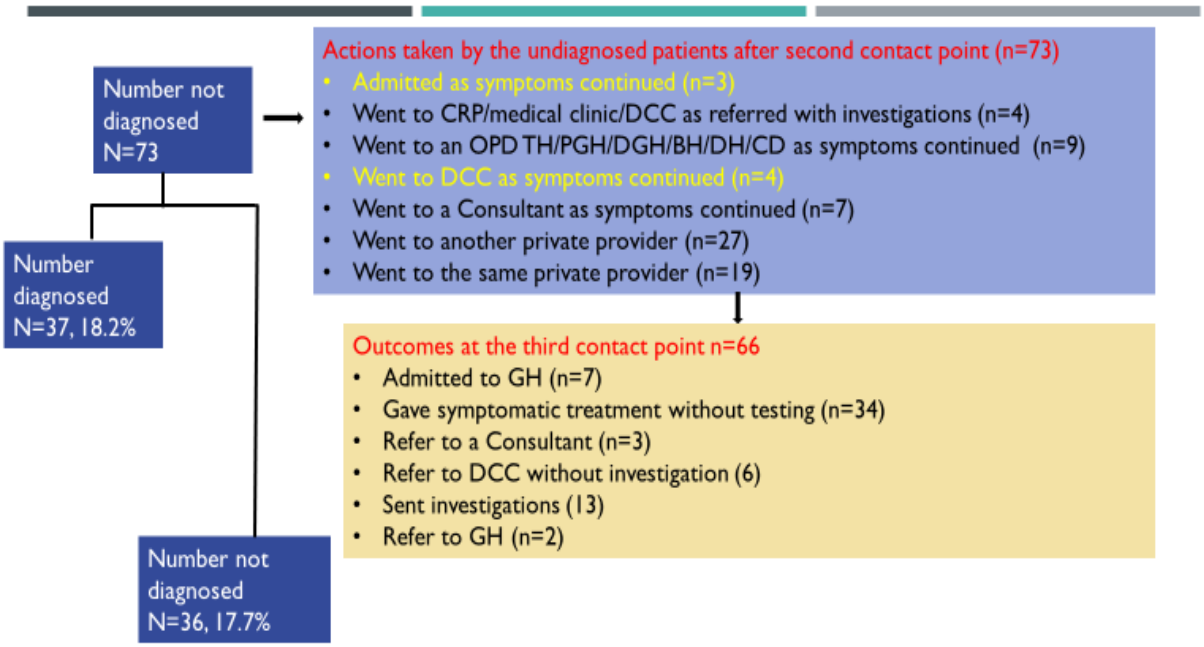


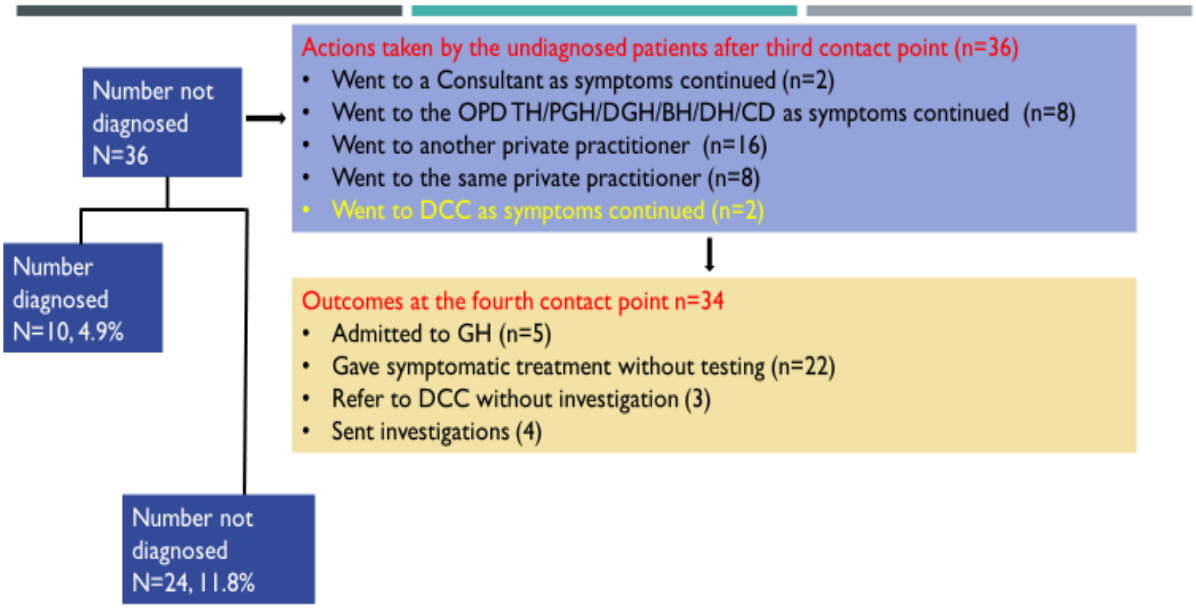


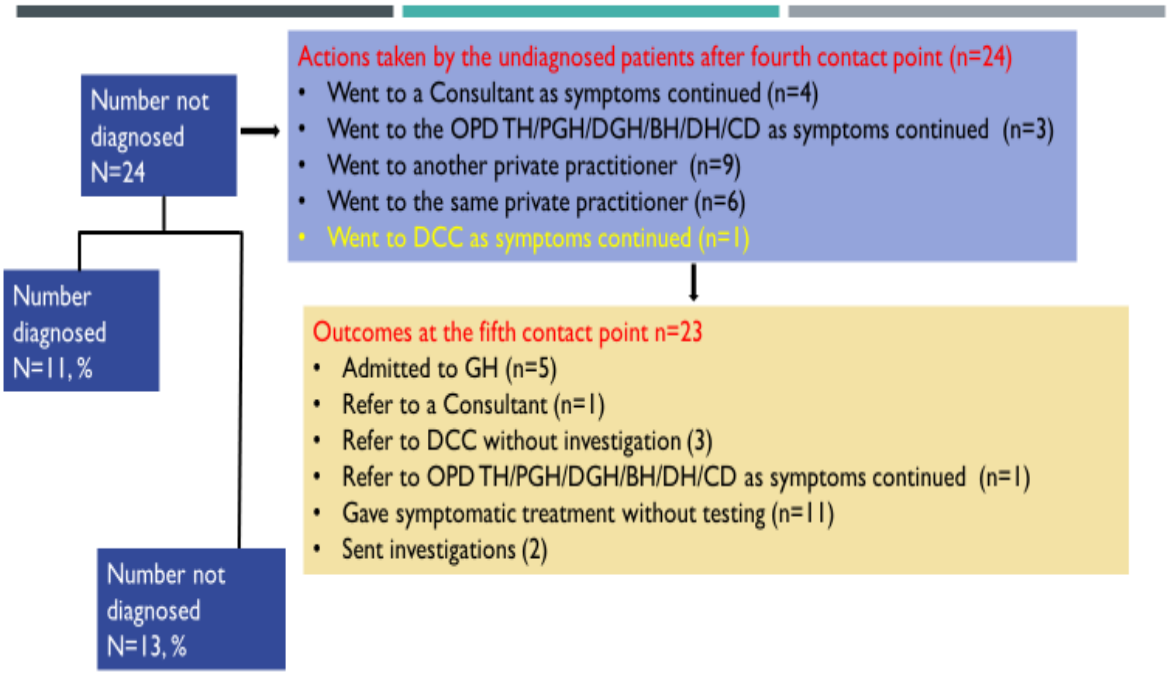

Number not diagnosed N=2
Actions taken by the undiagnosed patients after fifth contact point (n=2)
• Admitted as symptoms continued (n=1)
• Went to a private provider (n=1)
Outcomes at the fifth contact point n=1
• Admitted to GH (n=1,)
Number diagnosed N=2,

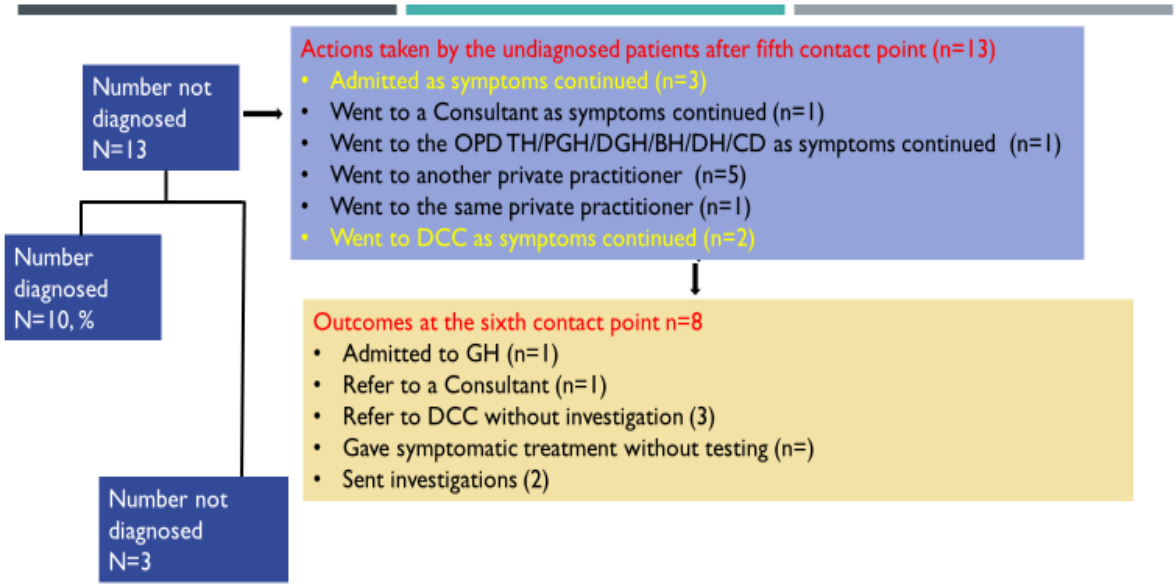
A. OUTCOME OF THE PATIENTS WHO FIRST VISITED PART TIME PRIVATE PRACTITIONER (N=203)






Number not diagnosed N=36
Actions taken by the undiagnosed patients after third contact point (n=36)
• Went to a Consultant as symptoms continued (n=2)
• Went to the OPD TH/PGH/DGH/BH/DH/CD as symptoms continued (n=8)
• Went to another private practitioner (n=16)
• Went to the same private practitioner (n=8)
• Went to DCC as symptoms continued (n=2)
Number diagnosed N=10, 4.9%
Outcomes at the fourth contact point n=34
• Admitted to GH (n=5)
• Gave symptomatic treatment without testing (n=22)
• Refer to DCC without investigation (3)
• Sent investigations (4)
Number not diagnosed N=24, 11.8%


Number not diagnosed N=24
Actions taken by the undiagnosed patients after fourth contact point (n=24)
• Went to a Consultant as symptoms continued (n=4)
• Went to the OPD TH/PGH/DGH/BH/DH/CD as symptoms continued (n=3)
• Went to another private practitioner (n=9)
• Went to the same private practitioner (n=6)
• Went to DCC as symptoms continued (n=1)
Number diagnosed N=11, %
Outcomes at the fifth contact point n=23
• Admitted to GH (n=5)
• Refer to a Consultant (n=1)
• Refer to DCC without investigation (3)
• Refer to OPD TH/PGH/DGH/BH/DH/CD as symptoms continued (n=1)
• Gave symptomatic treatment without testing (n=11)
• Sent investigations (2)
Number not diagnosed N=13, %


Number not diagnosed N=13
Actions taken by the undiagnosed patients after fifth contact point (n=13)
Admitted as symptoms continued (n=3)
Went to a Consultant as symptoms continued (n=1)
Went to the OPD TH/PGH/DGH/BH/DH/CD as symptoms continued (n=1)
Went to another private practitioner (n=5)
Went to the same private practitioner (n=1)
Went to DCC as symptoms continued (n=2)
Number diagnosed N=10, %
Outcomes at the sixth contact point n=8
Admitted to GH (n=1)
Refer to a Consultant (n=1)
Refer to DCC without investigation (3)
Gave symptomatic treatment without testing (n=)
Sent investigations (2)
Number not diagnosed N=3

SUMMARY OF CARE PATHWAY

- Majority of the patients have chosen government sector (n=386, 52%) as the first contact point.
- However, when it comes to institutions, majority has selected private practitioners as the first contact point (n=203, 27.3%).
- The proportion of patients diagnosed at the first contact point is the highest when the patients have selected the DCC as the first contact point (n=63, 91.3%)
- It is 60.6% (n=232) for government institutions and 33.7% (n=97) for private institutions.
- In the government sector, at the second and third contact points 84% and 93.8% of the total patients was diagnosed respectively. When they reached 4^{th} 5^{th} and 6^{th} contact points, 97.2%, 97.9% and 100% of total patients were diagnosed
- In the private sector, 2^{nd} – 70.1%, 3^{rd} – 85.8%, 4^{th} – 91%, 5^{th} – 95.8% and 6^{th} – 99% of total patients were diagnosed
- The major outcome of the patients visited to government institution was admission to government hospital (n=138, 35.8%). The second was “gave medicine without testing (n=123, 31.9%) and the third and fourth were “sending investigations in the same hospital (n=67, 17.4%) and “refer to DCC without investigation (n=39, 10.1%)
- In the government institutions, of the 232 patients who were diagnosed at first time, majority (n=115, 49.6%) was diagnosed after admitting to government hospitals, 26.3% (n=61) was after sending investigations as outpatient and 16.4% (n=38) after sending the patients to DCC.
- The major outcome of the patients visited to private institution was “gave medicine without testing (n=180, 62.5%) . The second was “send investigations in the same hospital (n=35, 12.2%) and the third and fourth we “send investigation in a nearby hospital (n=24, 8.3%) and refer to DCC without investigation (n=21, 7.3%) respectively.
- Of the patients diagnosed at first contact point in private institutions, 23.7% (n=23) was diagnosed after sending investigations in the same hospital, 21.6% referring patients to DCC (n=21), 20.6% (n=20) after sending investigations in a nearby hospital, and 14.4% (n=14) after admitting to GH.

SUMMARY OF PATIENT DELAY

Median 21 days (IQR: 16, range 1-730 days)

Patient delay	Number of patients	proportion
Up to 1 week	150	20.2
1 to 2 weeks	176	23.7
2 to 3 weeks	116	15.6
3 weeks to 1month	138	18.6
1 to 2 months	95	12.8
2 to 3 months	34	4.6
3 to 6 months	20	2.7
6 months to 1 year	12	1.6
1 year 2 years	2	.3
Total	743	100

HEALTH SYSTEM DELAY- DIAGNOSTIC DELAY

First contact	Mean (days)	Median	IQR (days)	Range
DCC	4	2	1	1-60
Government	13	7	9	1-180
Private	26	14	23	1-360

SUMMARY OF DIAGNOSTIC ACCESS

Type of	Number of	% of patients	N and % of	% of
Teaching	86	67 (77.9%)	86 (100%)	86 (100%)
Provincial	6	6 (100%)	6 (100%)	6 (100%)
DGH	40	38 (95%)	29 (72.5%)	40 (100%)
Base	145	137 (94.5%)	0	140 (96.6%)
District	71	37 (52.1%)	0	7 (9.9%)
PMCI/CD	36	2 (5.6%)	0	0
Consultant	29	15 (51.7%)	0	27 (93.1%)
Private	12	7 (58.3%)	1 (8.3%)	10 (83.3%)
General	45	0	0	4 (8.9%)
Private	203	0	0	0

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