Deder General Hospital

Healthcare Quality Improvement Project

Improving the Diagnostic Screening of Non-communicable Disease (NCD) Complications

By: OPD QI TEAM

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ABSTRACT

Introduction:

Non-communicable diseases (NCDs) like hypertension and diabetes remain leading causes of illness and death around the world. At Deder General Hospital, an initial assessment showed that only 41% of patients with NCDs were being screened in a manner for complications. This gap led to missed chances for early treatment and a growing number of patients presenting with serious, advanced-stage conditions.

Methods:

The aim of this QI was to improve diagnostic screening for NCD complications from a baseline of 41% to 80% from December 1, 2017E.C, to May 30, 2017E.C. The outpatient department (OPD) quality improvement team carried out **four PDSA (Plan-Do-Study-Act) cycles.** These focused on **training staff, setting up a dedicated OPD laboratory**, ensuring a **consistent supply of diagnostic tools** and **reagents**, and closely **monitoring performance every two weeks**.

Results:

By the end of the project, Complication screening had jumped to **83%.** The number of patients arriving with advanced complications **fell sharply** from **29% to just 3%. Patient satisfaction** also rose, from **53% at baseline to 86%** a clear reflection of improved service quality. These gains were largely made possible through better access to diagnostics, empowered staff, and a more accountable system.

Conclusion:

This experience shows that even in resource-limited environments, structured and team-based quality improvement efforts can make a meaningful difference. With simple, focused changes, Deder General Hospital was able to detect NCD complications earlier, prevent severe outcomes, and build greater trust among patients. It's a powerful reminder of what local innovation and commitment can achieve in healthcare.

INTRODUCTION

Non-communicable diseases (NCDs), such as hypertension, diabetes mellitus, and cardiovascular diseases, are long-term conditions that often develop silently but can lead to severe complications if undetected or untreated. At Deder General Hospital, many patients with NCDs present with late-stage complications due to missed opportunities in early detection. These complications increase the burden on the healthcare system and reduce patient quality of life. This Quality Improvement (QI) project aims to enhance the early detection of complications associated with NCDs by optimizing detection and follow-up systems in the hospital's chronic care unit.

ORGANIZATION'S MISSION, AND VISION

- **Mission:** To provide accessible, high-quality, and compassionate healthcare services to improve the well-being of our community.
- **Vision:** To be a center of excellence in patient-centered and evidence-based healthcare services.

PRIORITIZATION MATRIX

Sno	Problems	Magnitude	Severity	Feasibility	Gov't Concern	Community Concern	Total	Rank
1	Low medical record completeness	5	3	4	5	2	19	2nd
2	Low implementation of OPD appointment system	3	3	2	3	3	14	7th
3	Low OR table efficiency	3	4	3	2	3	15	6th
4	>24 hour patient staying time at emergency department	3	3	2	5	3	16	5th
5	Poor protocol adherence	3	3	5	3	3	17	4th
6	High ICU mortality rate	3	3	5	4	3	18	3rd
7	**High missed opportunities in detecting complications of NCDs**	**4**	**4**	**5**	**5**	**5**	**23**	**1st**
Rating scale= minimum 5, maximum 50								

PROBLEM STATEMENT

A retrospective survey conducted between **September 2017 and November 2017** revealed that only **41%** of patients with high-risk non-communicable diseases (diabetes and hypertension) currently receive routine detection for serious complications. This lack of detection results in undetected progression to advanced disease (such as retinopathy, chronic kidney disease, and heart failure), resulting in preventable hospitalizations, increased costs, and reduced quality of life.

AIM STATEMENT

- To improve diagnostic screening for NCD complications from a baseline of **41%** to **80%** from December 1, 2017E.C, to May 30, 2017E.C.

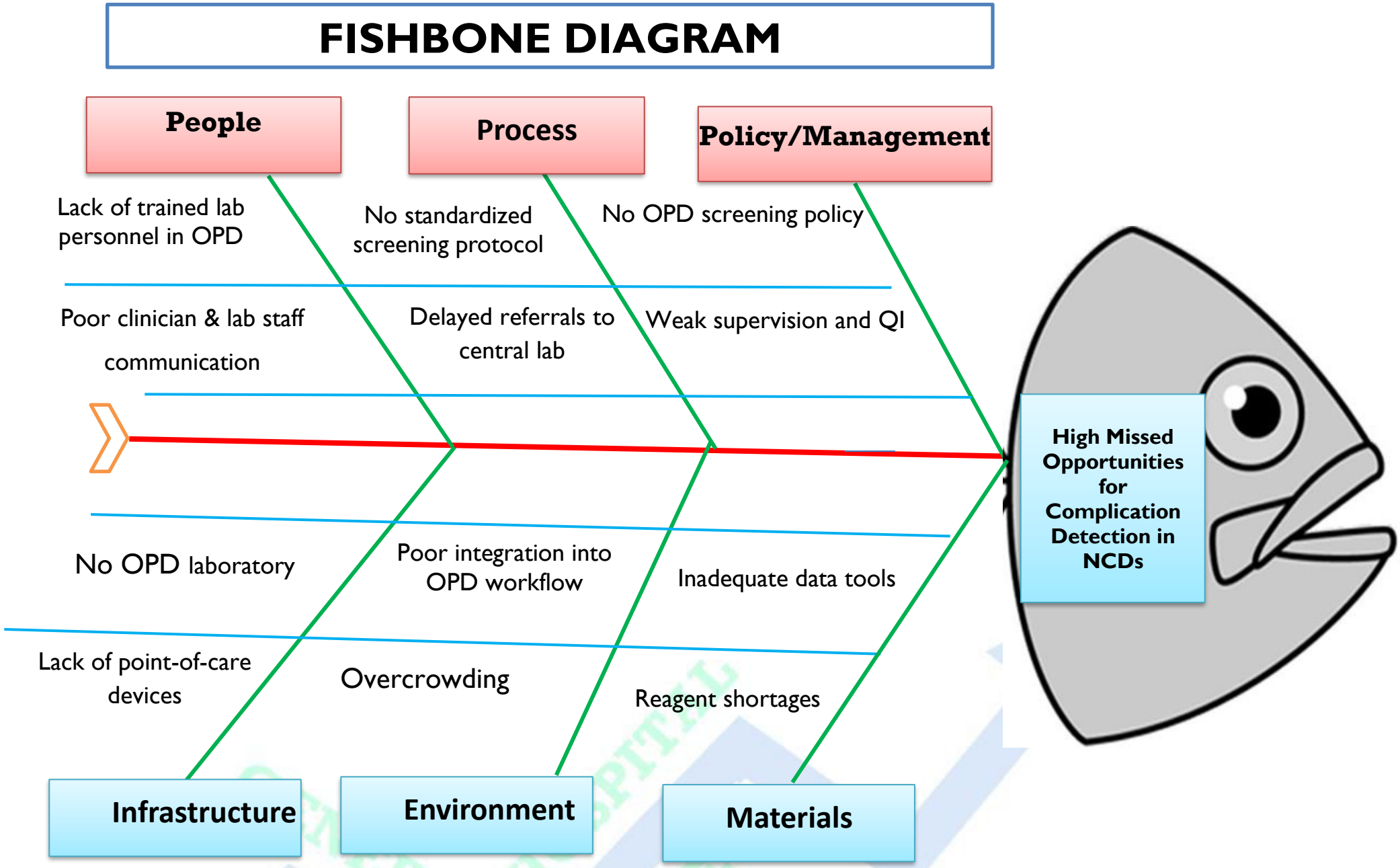

Figure 1: fish bone diagram *to improve diagnostic screening for NCD complications from a baseline of 41% to 80% from December 1, 2017E.C, to May 30, 2017E.C.*

DRIVER DIAGRAM

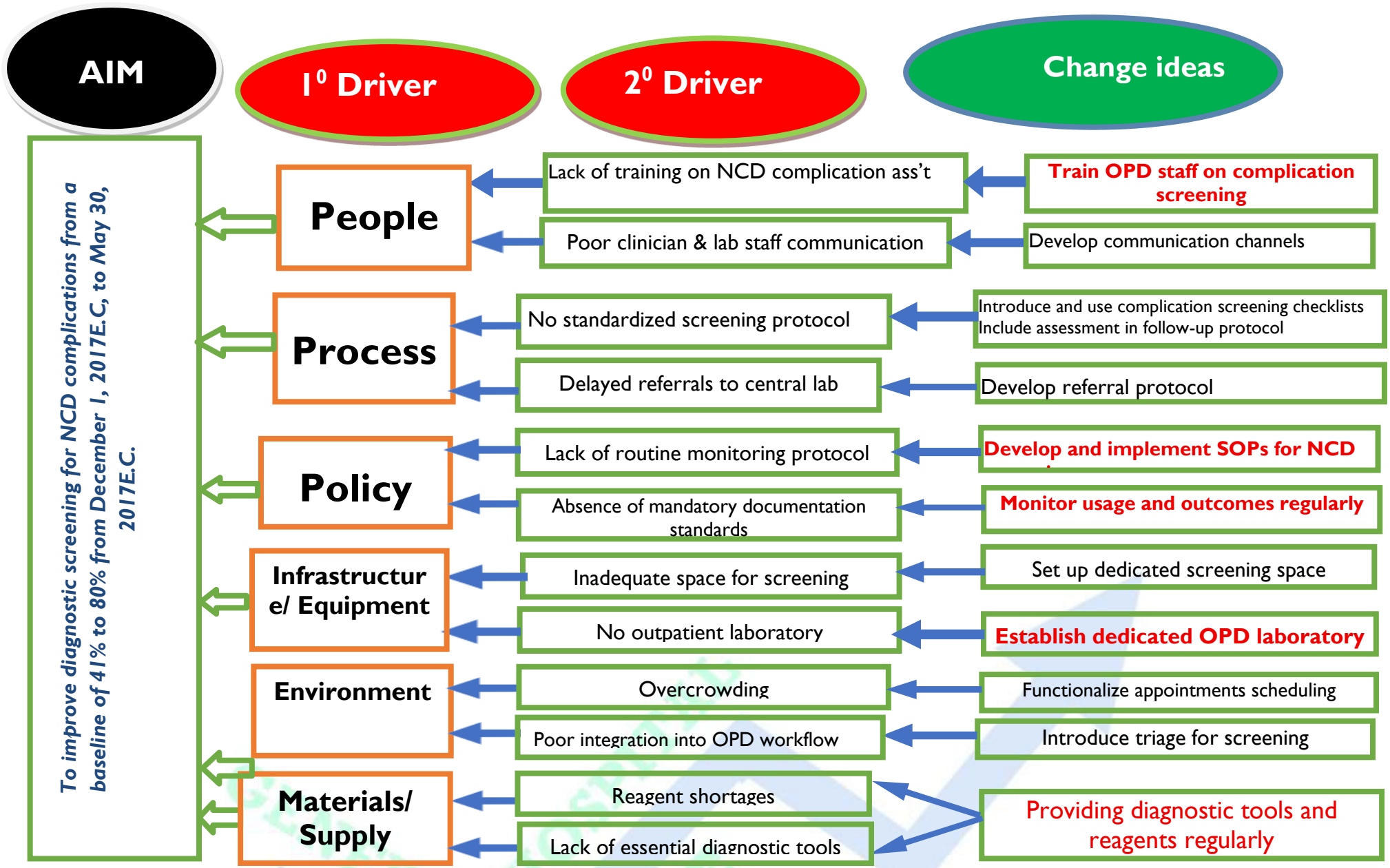

Figure 2: Driver diagram to improve diagnostic screening for NCD complications from a baseline of 41% to 80% from December 1, 2017E.C, to May 30, 2017E.C.

LIST OF PRIORITIZED NTERVENTIONS/CHANGE IDEAS

1. Train OPD staff on complication detection
2. Establish dedicated OPD laboratory
3. Providing diagnostic tools and reagents regularly
4. Monitor usage and outcomes regularly

MEASURES

Outcome Measure:

- % of NCD patients receiving **diagnostic screening for NCD complications.**

Process Measures:

- % of OPD staff trained on NCD complication detection.
- Number of dedicated OPD laboratory established
- Availability of essential diagnostic tools and reagents (% of days stocked).
- % of follow-up charts with documentation of detection results.

Balancing Measure:

- % of patients developed complications of non-communicable diseases.
- % of patient satisfaction

Operational definition

" ***diagnostic screening***: *Evidence-based detections completed* ***within recommended intervals*** *(e.g., annual retinal exams for diabetics, yearly eGFR/UACR for hypertensives).*

Measures/Indicators

Table 2: ***Outcome measure***

Aim	Indicators	Numerator	Denominator	Data Source	Responsible Body
To improve diagnostic screening for NCD complications from a baseline of 40% to 90% from December 1, 2017E.C. to May 30, 2017E.C.	Proportion of eligible patients screened for NCD complications within recommended timeframe	Number of patients screened for NCD complications within the clinically recommended timeframe	Total number of patients eligible for screening for complications of non-communicable diseases	**Routine health facility registers** & EMR databases	**NCD Program Team**

Measures/Indicators---

Table 3: Process Measures

Change idea	PROCESS MEASURES			
	Indicators	Numerator	Denominator	Data source
Train OPD staff on complication detection	% of OPD staff trained on complication detection	Number of OPD staff trained	Total number of OPD staff	Training attendance sheet
Establish dedicated OPD laboratory	% of days OPD lab service is functional	Number of days OPD lab is functional	Total OPD working days	OPD lab logbook / daily report
Providing diagnostic tools and reagents	% availability of essential diagnostic tools and reagents	Number of days tools/reagents were available	Total number of assessment days	Stock/inventory records
Monitor usage and outcomes regularly	% of NCD cases with complication detection results documented and reviewed	Number of NCD patient charts with detection documented and reviewed	Total number of NCD patient charts reviewed	Patient charts / NCD follow-up registry

IMPLEMENTATIONS OF PLAN OF PDSA

Table 1: ***Process Measures****:*

Change Idea	HOW	WHO	When	Where
Train OPD staff on complication detection	➤ The hospital conducted on-site training sessions for OPD staff using national guidelines and complication detection job aids. Trainers applied interactive approaches, including case-based discussions and role plays, to build staff capacity on early detection of NCD complications.	Quality Officer, OPD Head	1st week of July	Hospital training hall
Establish dedicated OPD laboratory	➤ The facility renovated a suitable room within the OPD area, assigned qualified laboratory personnel, and equipped the space with essential diagnostic machines and materials. The lab was prepared to ensure investigation of NCD-related complications.	Medical Director, Lab Head	By mid-July	OPD wing, Deder General
Providing diagnostic tools and reagents regularly	➤ The procurement team and pharmacy unit ensured that essential diagnostic tools and reagents were supplied consistently. Requests were submitted in advance, and stock levels were reviewed monthly to prevent interruptions.	Procurement Unit, Lab Storekeeper	Monthly (ongoing)	Lab store & OPD lab
Monitor usage and outcomes regularly	➤ The quality and M&E teams carried out monthly reviews of patient charts and laboratory registers to check whether complication detection was done and documented properly. Findings were discussed during performance review meetings.	M&E Officer, QI Team	Monthly (end of month)	QI office & OPD records

Table 2: ***Data collection Plan (process indicators)***

Process/Change Idea	Data Source (Where)	Data Collection Method (How)	Time (When)	Responsible body
Train OPD staff on complication detection	Training attendance records, pre/post-test scores	Sign-in sheets, knowledge assessments	**December 01-15, 2017E.C**	HR, Lab Coordinator
Establish dedicated OPD laboratory	Lab inventory logs, space assessment reports	Facility checklists, procurement records	**December 16- February 15, 2017E.C**	CEO, Engineering Team
Providing diagnostic tools and reagents regularly	Stock registers, lab requisition forms	Monthly stock audits, usage logs	**February 16- April 15, 2017E.C**	Procurement Unit, Lab Head
Monitor usage and outcomes regularly	Lab test registers, patient charts, feedback forms	Electronic records, clinician interviews, surveys	**April 16- May 30, 2017E.C.**	M&E Officer, QI Team

Table 3: *Process Indicator Performance Tracking Sheet*

S.No	Change Ideas/ Interventions				Remark
		Number/session on planned	Number/session performed	% of achievement	
1.	Train OPD staff on complication detection	1	1	100	
2.	Establish dedicated OPD laboratory	1	1	100	
3.	Providing diagnostic tools and reagents regularly	2	2	100	
4.	Monitor usage and outcomes regularly	2	2	100	

Do of PDSA

Table 4: ***Outcome Indicators Performance Tracking Sheet***

	OUTCOME INDICATOR 1												
			Time: Bi-Weekly										
AIM	Numerator, Denominator & outcome Indicator	15-Dec-17	30-Dec-17	15-Jan-17	30-Jan-17	14-Feb-17	28-Feb-17	15-Mar-17	30-Mar-17	15-Apr-17	30-Apr-17	15-May-17	30-May-17
improve diagnostic screening for NCD complications from a baseline of 41% to 80% from December 1, 2017E.C, to May 30, 2017E.C.	**Numerator**: Number of patients screened for NCD complications within the clinically recommended timeframe	5	6	8	8	6	6	4	8	8	9	7	9
	Denominator: Total number of patients eligible for screening for complications of non-communicable diseases	9	9	9	9	9	9	9	9	9	9	9	9
	Indicator: Proportion of patients screened for NCD complications	56	67	89	89	67	67	44	89	89	100	78	100

RESULTS

The results of the NCD Quality Improvement Project demonstrated significant progress in achieving its objectives. Over the six-month period from December 2017E.C to May 2017E.C, the **rate of screening for complications** in chronic NCD patients improved dramatically from a baseline median of **41% to a final rate median of 83%,** surpassing the original target of 80% (**Figure 3**). In parallel, **balancing indicators** showed a **decline** in the proportion of patients presenting with **NCD complications from 29% (31 out of 108) to 3%(3 out of 108)** and a **rise in patient satisfaction scores** **from 53% to 86%** (**Figure 4**), confirming that the intervention not only improved processes but also positively impacted outcomes and patient experience. This success was driven by **sequential PDSA cycles**, which included **staff training, the establishment of a dedicated OPD laboratory**, **Providing diagnostic tools and reagents regularly,** and **regular data audits.** Notably, the reduction in missed screening opportunities led to earlier detection and better management of complications such as hypertensive organ damage and diabetes-related comorbidities.

PDSA Cycle 1: The first step was to ensure that our outpatient (OPD) staff fully understood what to screen for and why it matters. We provided targeted on-the-job training focused on the detection of NCD complications, following national guidelines. Staff learned how to identify early signs of issues like diabetic nephropathy, cardiovascular risks, and hypertensive damage. This helped create a shared understanding and built confidence among providers. As a result, the screening rate rose from **40% to 56% (5 of 9).** Still, without diagnostic services directly in the OPD, some screenings couldn't be completed on time, and patients were sometimes referred elsewhere and lost to follow-up **(figure 3)**.

The **PDSA Cycle 2** introduced a **dedicated laboratory** within the OPD to enable immediate diagnostic testing. This lab was physically linked to the OPD unit, which made diagnostic testing more immediate and accessible. Previously, patients had to go to the main lab, often experiencing delays or confusion. Now, tests like blood sugar, creatinine, and urine protein could be done on-site and on the same day. This significantly reduced missed opportunities and **increased the screening rate** to **78% (28 of 36)**. However, we began to notice that when reagents or tools were out of stock, even the new lab couldn't function properly—so the next cycle focused on supplies **(figure 3)**.

PDSA Cycle 3: Building on the previous cycle, this phase aimed to ensure that diagnostic tools and essential reagents were consistently available in the OPD lab. We worked with the pharmacy and store teams to monitor stock levels and set up a restocking schedule based on OPD patient volume. With tools like glucometers, test strips, urine dipsticks, and blood chemistry reagents reliably on hand, providers could confidently perform screening without interruption. This change boosted the screening rate even further to **93% (26 of 28)**. The availability of supplies removed a major barrier, but to make sure the improvements lasted, we needed a way to stay on top of progress and detect new gaps early **(figure 3)**.

PDSA Cycle 4: In the final phase, we introduced a simple but **effective monitoring system**. Screening coverage was tracked weekly using a register, and the results were shared with the team during regular meetings. Dashboards displayed screening performance and complication trends, helping staff reflect on what was working and where further improvements were needed. This created a culture of shared accountability and motivation. As a result, screening coverage reached **93% (25 of 27) (figure 3).**

As screening for NCD complications improved, we observed a meaningful **decline in the proportion of patients presenting with advanced complications** such as renal failure, stroke, and poorly controlled diabetes from **29% (106 out of 366) to 3% (19 out of 612)**, This early detection helped shift care from reactive treatment to proactive prevention, improving overall patient outcomes. Additionally, **patient satisfaction** rose from previous levels **53% to 86%,** as individuals reported greater trust in the health system and appreciated the faster, more comprehensive care they received. Importantly, the dedicated OPD lab reduced patient wait times and transportation burdens, minimizing dropouts during follow-up. Overall, the changes not only enhanced clinical quality but also strengthened patient confidence and continuity of care.

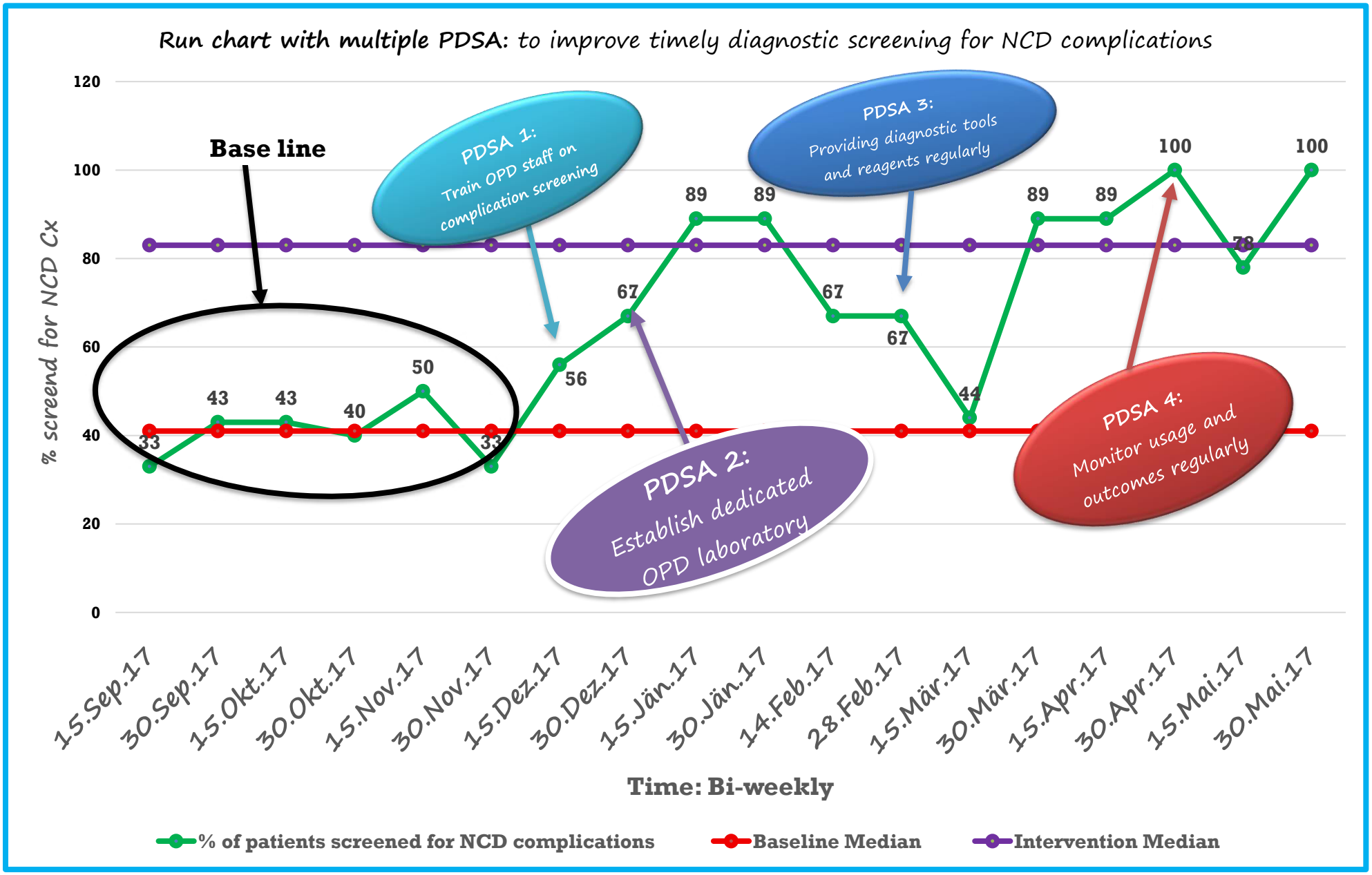

Figure 3: Run chart with multiple PDSA to improve timely diagnostic screening for NCD complications from a baseline of 40% to 90% from December 1, 2017E.C, to May 30, 2017E.C.

Balancing Measure: Impact

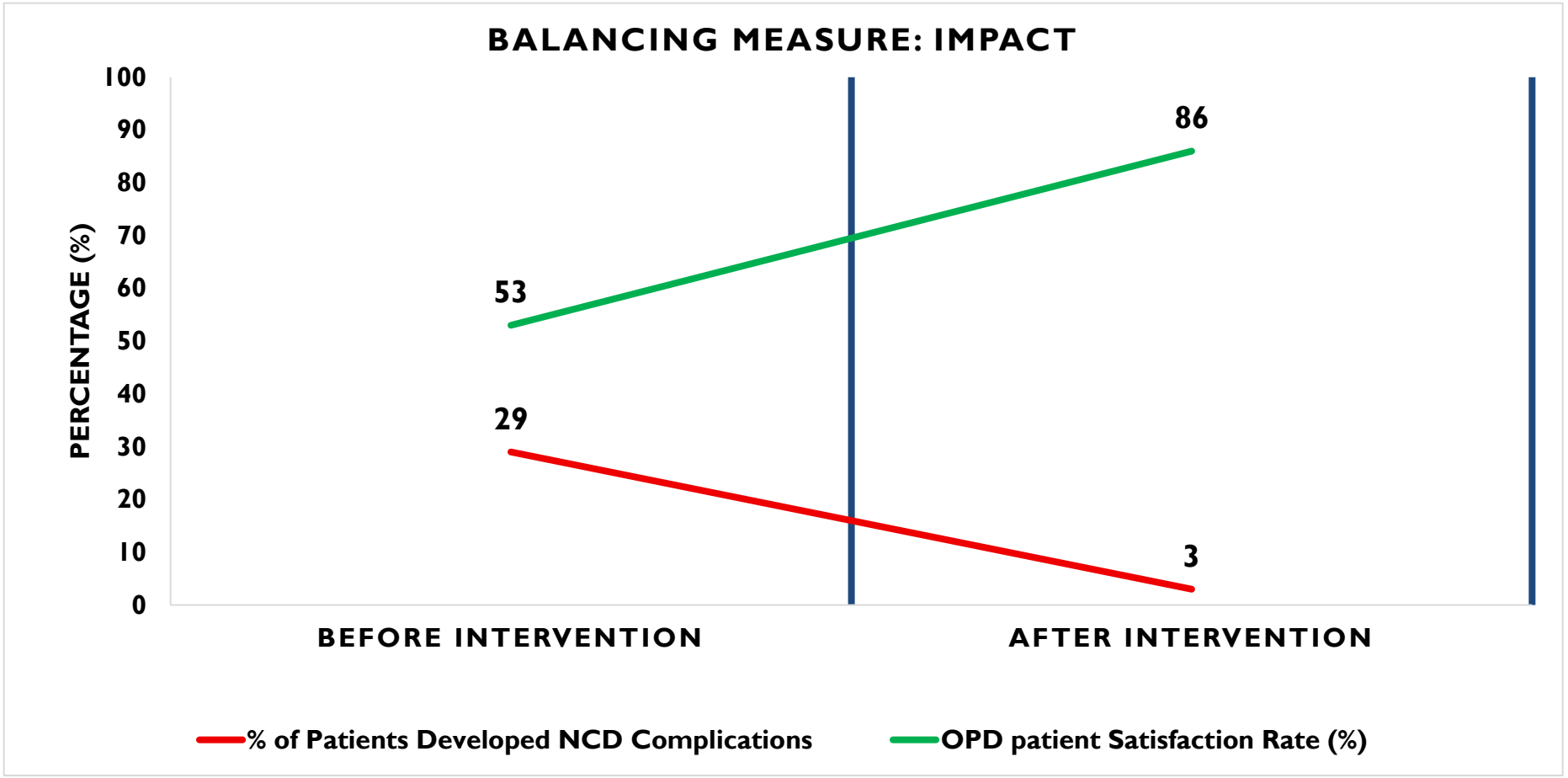

***Figure** 4:* Shows that improving diagnostic screening for NCD complications resulted in improved patient satisfaction and a reduced proportion of patients with NCD complications at the Chronic Care Follow-up Clinic of Deder General Hospital, from December 1, 2017 to May 30, 2017

Discussion

This quality improvement project, focused on improving the detection of non-communicable disease (NCD) complications at Deder General Hospital, proved to be both effective and impactful. Before the intervention, many patients with chronic conditions like hypertension and diabetes were not receiving regular complication screenings. As a result, diagnoses were often delayed, and preventable complications were going unnoticed. By implementing a series of PDSA (Plan-Do-Study-Act) cycles, the project systematically tackled this issue—raising screening coverage from just 40% to over 90% by the end of the intervention.

One of the most important changes was the creation of a dedicated OPD laboratory. Having diagnostic services available on-site significantly cut down on delays and made it easier for clinicians to act quickly when problems were identified. Alongside this, staff received targeted training and the hospital ensured a consistent supply of necessary reagents and tools. These efforts made it possible to catch complications earlier and intervene before they became more serious. As a result, the number of patients arriving with advanced complications dropped dramatically—from 29% to only 3%. Integrating screening into daily OPD routines also helped make it a standard part of care, which boosted staff engagement and improved patients' confidence in the services they were receiving.

Consistent monitoring was another key factor in the project's success. Weekly performance reviews, run charts, and visual dashboards gave the team clear insight into what was working and what needed adjustment. This openness encouraged collaboration and a shared sense of responsibility across departments. In addition to improving the technical aspects of care, the hospital also saw a significant boost in patient satisfaction—rising from 53% to 86%.

Overall, the project shows that with the right approach—grounded in data, teamwork, and practical solutions—even facilities with limited resources can make major strides in managing chronic diseases and improving patient outcomes.

Lessons Learned

This project showed us that real change is possible—even in settings with limited resources—when there's strong teamwork, committed leadership, and well-focused actions. By setting up a dedicated OPD laboratory, making sure diagnostic tools were always available, and training our staff to recognize complications early, we significantly improved how we screen for chronic disease issues. Ongoing data tracking and regular feedback helped us stay on course and built a sense of shared responsibility among the team. Above all, we learned that quality improvement isn't a one-time fix—it's an ongoing journey of learning, adjusting, and working together for better care.

Messages for Others

This project shows that even in settings with limited resources, real progress in managing chronic diseases is possible with the right approach. By working together, planning strategically, and using data to guide decisions, health facilities can make a big difference. One key takeaway is that making complication screening a regular part of NCD care isn't just possible—it's powerful. Starting with simple steps like training staff, making sure diagnostic tools are available, and setting up feedback loops can spark real improvements in both patient care and satisfaction. Above all, creating a culture where teams learn continuously, take shared responsibility, and actively solve problems is what helps these changes stick and grow across departments or even other facilities.

Conclusion

The quality improvement project at Deder General Hospital clearly showed that thoughtful, step-by-step changes can lead to meaningful results in chronic disease care. By following a series of targeted PDSA cycles—starting with staff training, setting up a dedicated OPD lab, ensuring consistent access to diagnostic tools, and regularly reviewing data—the hospital saw major improvements. Screening rates jumped from just 40% to over 90%, complication rates dropped sharply from 29% to only 3%, and patient satisfaction rose noticeably. These encouraging results show how teamwork, system redesign, and using data to guide actions can truly transform care quality, even in low-resource settings.

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