PARTICIPANT GUIDE

Hard Skills Capacity Building for

PHC Performance Management Programme

A five-day training to build your skills in data use, digital tools, and quality improvement for Primary Health Care.

Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**
Digital Literacy & MS Office	Data Management & Quality	Data Sources & Interpretation	Quality Improvement for PHC	Practicum & Application

Participant Name: _____

Facility: _____ District: _____

Introduction

Welcome to the Hard Skills Capacity Building Primary Health Care (PHC) Performance Management training programme!

The primary aspiration of Hard Skills Capacity Building for PHC Performance Management initiatives aims to enhance value & effectiveness of PHC systems by strengthening the very basic yet taken for granted, the managerial competencies of healthcare administrators in practical, data driven decision making and performance management for effective PHC service monitoring, planning and improvement.

This workbook will guide your learning journey across all modules. It includes:
- Key concepts and summaries
- Guided exercises
- Reflection prompts
- Notes and takeaway tools

The programme is practical and interactive and is designed to help you use data confidently to improve PHC services.

Contents

Day 1: Digital Literacy & Microsoft Office Skills

Training Schedule

Training duration: 5 days | Daily duration: ±6.5 hours (excluding breaks) | Approach: Interactive, hands-on, group-based learning

Today establishes a shared baseline of digital literacy. The focus is not mastery, but functional competence so that you can engage meaningfully with data, templates, dashboards, and reports later in the course.

> Remember: This is about building confidence, not perfection. Peer learning is encouraged — help each other!

Digital Literacy & Microsoft Office Skills

> **Purpose**
> Build baseline digital confidence to support later data and QI work.

Time	Session	Focus
08:30–09:00	Session 1.1	Orientation and expectations
09:00–10:00	Session 1.2	MS Word: navigation and document management
10:00–10:45	Session 1.3	MS Word: text entry and formatting
10:45–11:00	***Tea break***	
11:00–11:45	Session 1.4	MS Word: tables, headers, bullets
11:45–12:45	Session 1.5	MS Excel: introduction and interface
12:45–13:30	***Lunch***	
13:30–14:45	Session 1.6	MS Excel: data entry and simple calculations
14:45–15:30	Session 1.7	MS Excel: charts and visualisation
15:30–16:00	Session 1.8	MS PowerPoint: basics

Time	Session	Focus
16:00–16:30	Session 1.9	Integrated practical exercise

Microsoft Word

1. Microsoft Word

Session 1.1: Orientation and Expectations

> **Purpose**
> To orient you to the training and set expectations.

By the end of this session, you should be able to:

- Understand the structure and goals of the five-day programme.
- Know what is expected of you as a participant.

Session 1.2: MS Word – Navigation and Document Management

> **Purpose**
> To ensure you can open, navigate, save, and reopen Word documents.

By the end of this session, you should be able to:

- Open and save a Word document to a known location.
- Use clear and consistent file naming.
- Navigate the Word interface confidently.

Session 1.3: MS Word – Text Entry, Formatting, and Layout

> **Purpose**
> To build basic document formatting skills for clear communication.

By the end of this session, you should be able to:

- Enter and select text.
- Apply font styles, sizes, and paragraph formatting.
- Use formatting purposefully to improve readability.

Session 1.4: MS Word – Tables, Headers, Footers, and Bullets

> **Purpose**
> To introduce structuring tools used in reports and correspondence.

By the end of this session, you should be able to:

- Insert and format a basic table.
- Add headers, footers, and page numbers.
- Use bullet and numbered lists.

Session 1.9: Practical Exercise

> **Purpose**
> To consolidate learning by applying Word, Excel, and PowerPoint skills.

By the end of this session, you should be able to:

- Create a Word document with text and a table.
- Build an Excel table with a percentage and chart.
- Copy a chart into Word.

1.1 Running the MS Word application

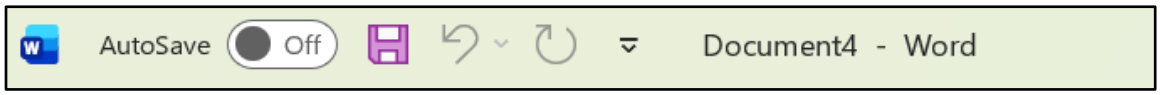
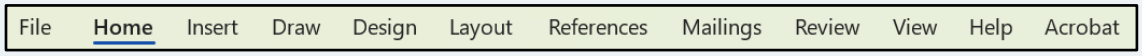
There are two ways to open the Microsoft Word application.
The first method is to open it using the **icon**. You can find the icon (a blue "W") either on the **desktop** or in the **All Programs** menu under the **Start Menu**.

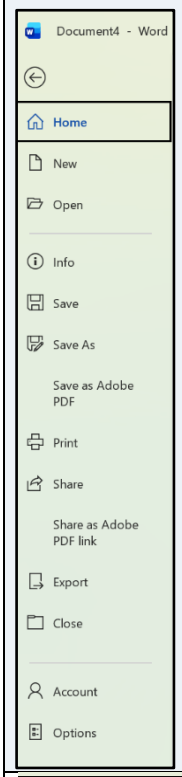
If you use the **All Programs** menu option, you will see a folder called **Microsoft Office** — you can find **MS Word** inside that folder.

If you use the **desktop icon** to open the application, simply **double-click** on it, or **select it once and press the Enter key**.

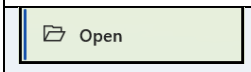
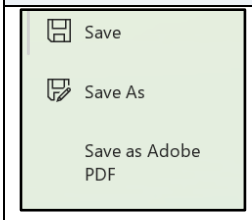
1.2 MS Word Interface

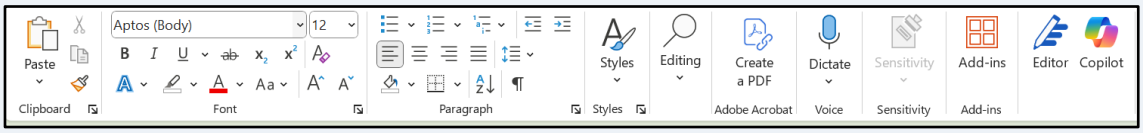
The following table contains all the important icons found on the various toolbars. You will find more detailed information about these icons later in the manual. The table below provides a quick reference to help you understand the function of each button.

Interface Item	Description
	**Title Bar:** The title bar in the MS Word window shows you which application is open and displays the name of the document. When you open MS Word, a new document is automatically created and opened by default. This is called the **default document**, and it is named **Document1**. If you create additional documents, they will be named **Document2**, **Document3**, and so on.
	**Menu Bar:** The menu bar functions in the same way as most other menu bars. Each option can be accessed by selecting it, which will display a **drop-down menu** containing additional commands and features.
	**Status Bar:** The status bar is located at the bottom of the Word window. It displays information such as the current page number, the total number of pages in the document, and whether you are in **Overtype** or **Normal** typing mode.



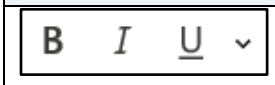
Standard Toolbar:
The Standard toolbar contains icons that provide quick access to many commonly used commands. These icons perform the same actions that can also be accessed through the **Menu Bar**.
Below is a more detailed description of some of these icons and their functions.

	**New Document:** This icon creates a new blank document.
	**Open Document:** This icon opens an existing document.
	**Save Document:** This icon saves the current document. If the document has not been named yet (for example, if it is still called *Document1*, *Document2*, etc.), you will be prompted to enter a name before it is saved.

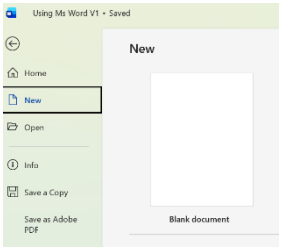


The Formatting Bar: This bar of icons is used to format items in MS Word. To format an item using these icons, select the item then press the icon. The exception to this action is the Font type, Font size, and Font styles. These are accessed by selecting the drop-down arrow next to the icon.

	Font type: To access the list of fonts available you can either select the words or the drop-down arrow.

	This will give you a list of fonts to choose from to format your selected text.
	Font Size: This drop-down list allows you to choose a size for the text that you have selected
	Bold, Italic, Underline: These buttons allow you to change the selected text to any of these options. Note: You can add all the options to one piece of text. Once the button is selected it stays pressed in. To take the option off the selected text, press it again.
	Text Alignment: These icons allow you to align text to either left, right, centre or justified.
	Bullets and Numbering: These two icons allow you to either bullet or number a set of selected text.
	Text Colour: This icon allows you to change the colour of the selected text.

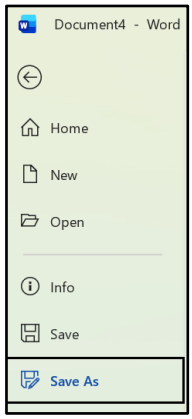
1.3. Creating New Documents



You can use one of the two methods to create a new document. You can either use the File Menu or the New Document icon.

Once you create a new document you will notice that it names it in a numerical sequence. By default, MS Word creates a new document when you open the application, and it is called Document 1. The next document you create well be called Document 2 and so on.

1.4. Saving Documents

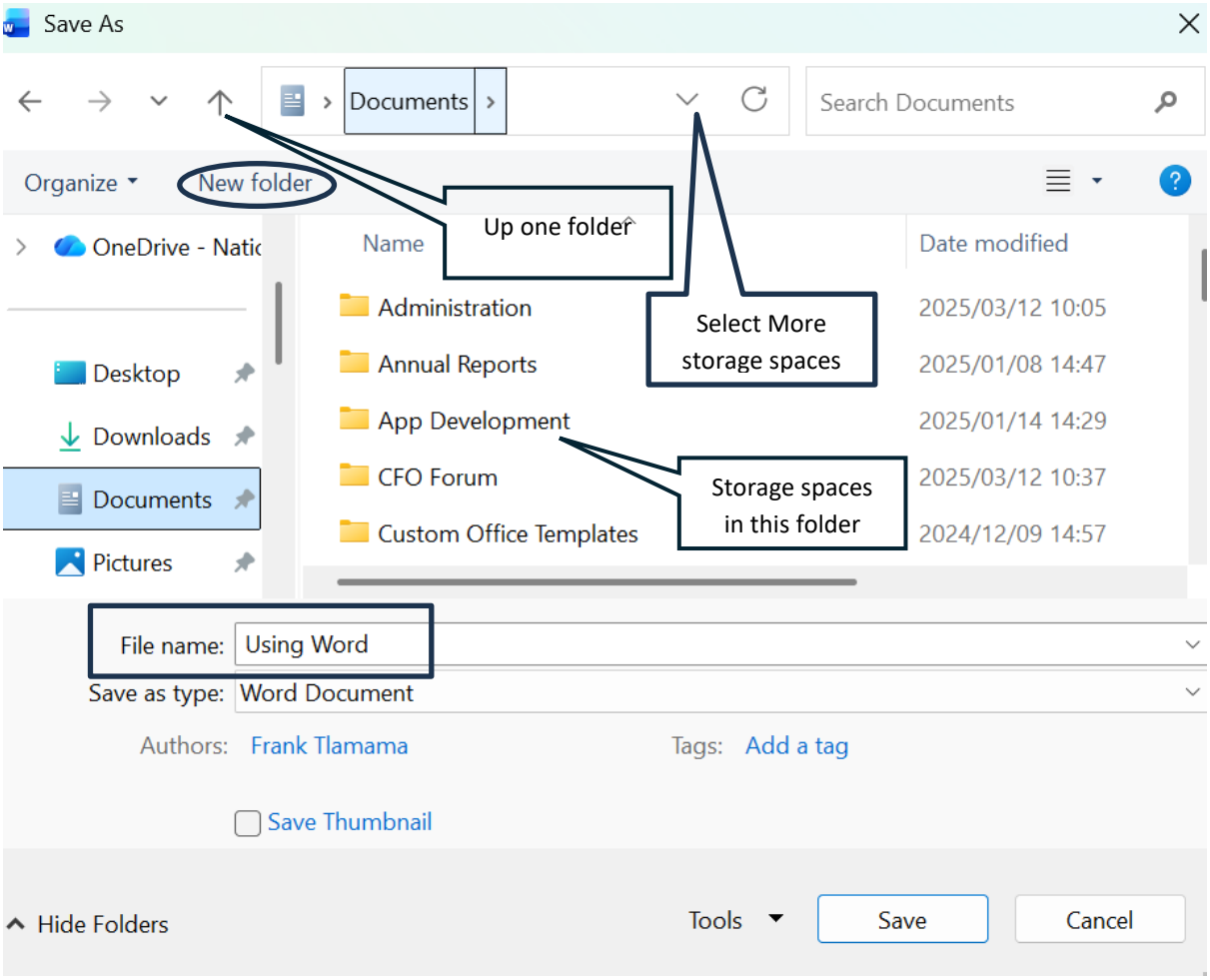


There are three options when saving a document

Option 1: Default saving (The first save) This happens when you save the document named Document 1

Option 2: Normal saving (Saving changes made to a document) This happens when you named your document, and you press the save button or option.

Option 3: Saving As (Creating a copy and changing the name of the document) This option allows you to rename your document. You are presented with the same options when you attempt to save the default document. If your document is named something other than the default name the selecting the Save option will show you nothing, it will just save your document if you are working on the default document or if you are attempting to rename your document then the following window will appear.



The labels in the interface refer to the following:

Storage spaces in this folder: double click on any of the folders shown to go into that folder

Select more storage space: This allows you to select from a list of storage spaces, including storage devices

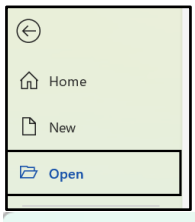
Up one folder: This button allows you to leave this current folder and navigate to the previous folder space.

Create new folder: This button allows you to create a folder in the new folder space that you are in now.

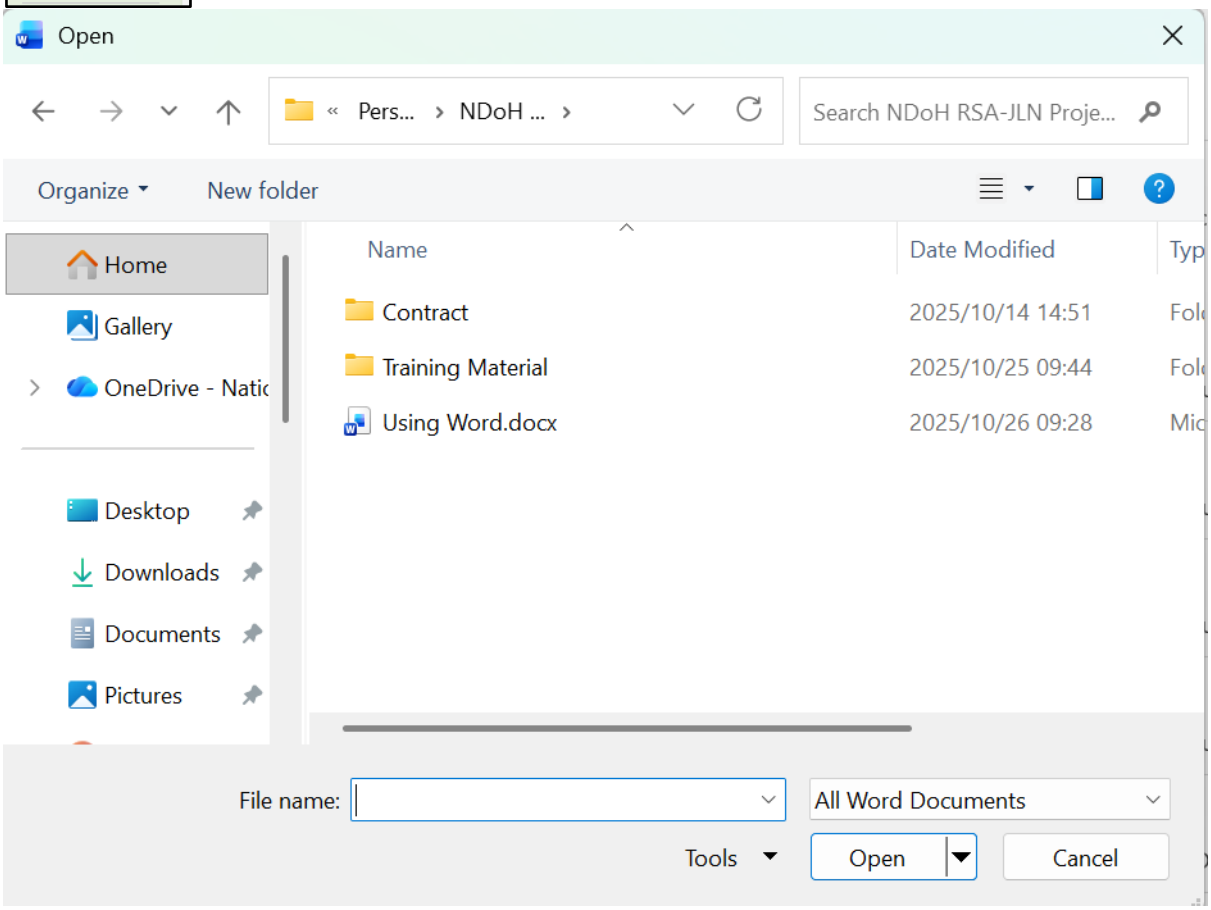
File name: This is where you will type the name of the file that you are going to save. When you save a document with a name, do not to use characters such as ?,! and others because they are not allowable and you will get an error that your document cannot be saved. Rather use an underscore (_).

The most important thing to remember when saving a document with a name is to name the document so that it makes sense and describes the contents of the document to some degree. Never name the document "Document 1" or something like that. It will not help you to find the document again if you want to open it.

1.5 Opening Documents

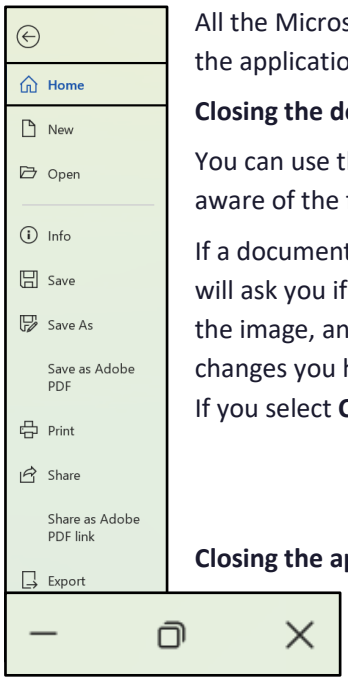


When you select the open option either from the File menu or the icon then you will be presented with a window that allows you to browse and find a document that exist in your storage space.



The Open Document interface looks very much the same as the Save As window. It allows you to browse to storage spaces and devices in the same way as that window. The big difference here is that when you select MS Word file and press the open button (it will become available when you select a file). MS Word will open a document for you. If the file is inside a folder, then double click on the folder to enter it and continue looking for a file.

1.6 Closing Documents and MS Word

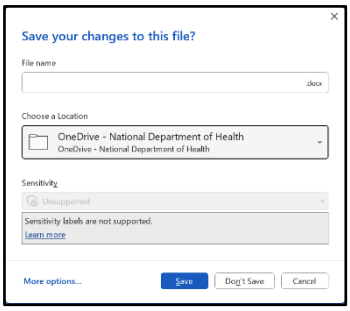


All the Microsoft Office applications have two methods to close both the document (window) and the application itself.

Closing the document:

You can use the file menu and then select Close to close the current document. You must be aware of the following:

If a document has not been saved, then closing the document will allow you to do so. MS Word will ask you if you want to save the Document as shown in the image, and if you select **No**, then you will lose all the changes you had made since you last saved the document. If you select **Cancel**, then it will stop closing the document.



Closing the application

You can either select the File Menu, or you can select the big X button in the top right-hand corner. Note: If you have any documents open that have not been saved, then MS Word will give you the option of saving them as shown in the previous item.

2. Creating Documents

2.1 Entering text into a document

A word processor such as MS Word is designed to display text and images for people to read. You can think of a Word Processor as a modern typewrite. The application takes text and places it in the right place and allows you to modify (format) it easily. There are few important things to remember about entering text into a Word Processor.

Keyboard keys:

Enter: This key allows you to go to the next line in the word processor. Open a default document and type some text and then press the Enter key to see what it does. The Enter key also creates paragraph spaces. This means you can Enter twice to create a big enough space to create a new paragraph.

Space Bar: The space is used to create space between words. It is only necessary to press it once between words.

Shift and letter/number: The shift key allows you to create the upper case of a letter. For example: pressing the "s" key creates an "s". Holding the shift button down and pressing the "s" key creates "S" instead. The same can be used for the symbols above the numbers on the keyboard, for example: pressing the "5" key creates a "5" but holding the shift button and pressing the "5" key creates the percentage symbol "%".

Caps Lock Key: this key works differently to any other key on the keyboard that you would normally use for typing. When you press the Caps Lock key once, then all letters you type will be in upper case. Press it again to "unlock" the upper case. Be careful with using the TAB key and Caps Lock. They are close to each other rand can be easily confused.

Punctuation keys: The punctuation keys are mostly found around the Enter key and they also operate in the same way with the Shift key.

Delete key and Backspace key: Both these keys are used to delete text but in different ways. The Delete key deletes from in front of the place where your cursor is and the Backspace key deletes the text behind the spaces where your cursor is.

Arrow keys: The arrow keys are found next to the shift button. These keys do not type any text, but they allow you to navigate through text. With the arrow keys you can go up, left, right and down from where your cursor is in the document.

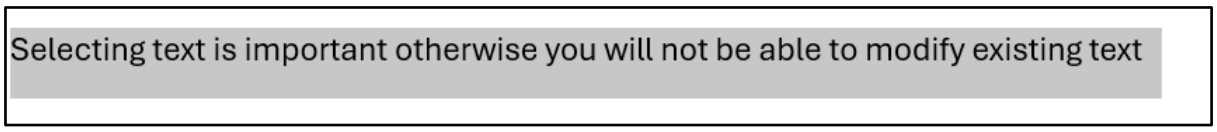
Undo button:

One of the most useful buttons that you will find in any of the Office applications is the undo button. This button is used to undo an action that you did not like.

2.2 Using Pages:

When you open a new document, you automatically have one page. If you look at the bottom left hand corner of the MS Word interface, you will see the page indicator. It will tell you which page you are on (Page 10 in the example) and how many pages are in the document (Page 10 of 10 in the example).

2.3. Selecting text:



Before you start modifying existing text, you must select that text. This is a very important rule to remember.

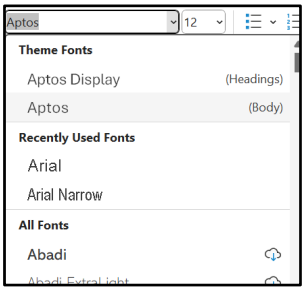
If text is not selected, then it will not change if you try and modify it!

To select a text, it is easy to use the mouse to do so. Click either in front of pr behind the text that you want to select. Then drag the mouse over the text you want to select. This will select the text as shown above. If you press a text modification button and you do not select the text first, then all the text that you type from there on will have the modification on it.

2.4. Formatting text:

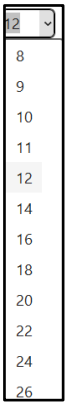
There are a lot of options to format text and the buttons and options needed to do so and, in this lesson, you will be looking at each option individually.

Fonts:



The font of the text is a name given to the way text looks. By default, all text entered into the document is in the Times New Roman font type. Once you have text selected you can change the font type by selecting the Font name in the Formatting toolbar at the top of the application interface. You will then see a long list of fonts that you can use. Times New Roman and Arial are the two most commonly used fonts professionally.

2.5 Font sizes:



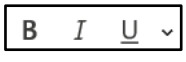
You can also change the size of the font of the selected text. To do this, select your text and then select the font size arrow next to the font interface. This will give you the option of choosing from the list of font sizes.

Note that you must always keep your text readable so be careful with using font size too much. Here are some of the reasons to change the size of a font:

Headings: It is best to change the font size of a heading by making it bigger than the normal size, usually the heading is 2 sizes bigger than the normal.

Printing: If you are going to print a document but you want to use less paper, then you can change the font to a smaller size to do this. Be careful it might be too small to read.

2.6 Bold, Italic and Underline:



These are the three buttons found next to the font size section. These three buttons are used to create the following effects when they are selected:

Bold: Selecting a text and then pressing Bold button will turn text into **Bold text**. The text becomes fatter and darker. This is used to emphasize text and to create headings and subheadings.

Italic: This button creates *this kind of text*. The text is slanted to the right. This kind of text is usually used for a kind of emphasis or to quote a text.

Underline: This button underlines the text selected. The text has an underline underneath it. It is also used to create headings. You can use the Format – Font window to change the underline styles as well, allowing you to have text with two lines in the underline.

Note: You can add all three effects to the selected text by having all three pressed in and it will create ***this kind of text for you***.

2.7 Text Alignment:

The next set of the text tools can be found next to the Bold, Underline and Italic section. Text alignment is the method used to place text on different places on the page. Once you have selected an alignment, then all the text will go to that position on the page. The alignment tools are:

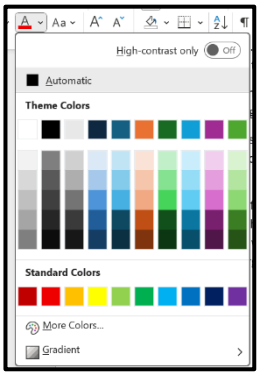
Left alignment: This is a default alignment, and it forces all text that is typed to start on the left-hand side of the page.

Centre alignment: This alignment forces the text to start in the middle of the page. It is a good way of ensuring that headings are placed in the centre of the page.

Right alignment: This alignment starts all text on the right-hand side of the page. This is useful for creating addresses in letters where the address should start on the righthand side of the page.

Justified: This type of alignment is a combination of left and right alignment. It forces text to span across the whole page so that no gaps are on either the left or the right side. You must be careful with using this option on text as it tends to stretch the text across the page creating large empty spaces between words.

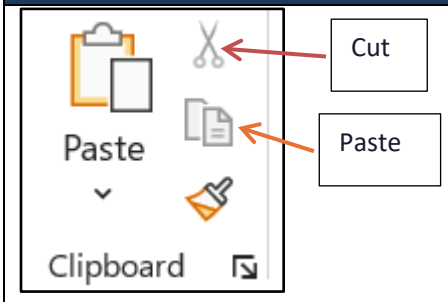
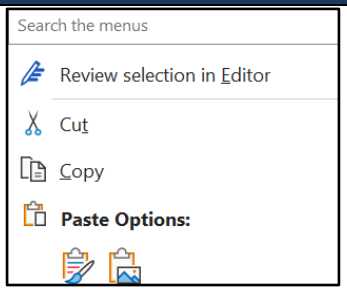
2.8 Text Colour:



You can also change the colour of the selected text by selecting the Font colour button which is found further to the right of the text alignment section. You will notice that the icon (letter A) has a colour line underneath it already (red by default). This is the colour that will be applied to your text. To choose a different text colour, select the arrow that is next to the "A". This will give you a list of colours to choose from. Select the colour that you want and the text you have selected will change to that colour. Be careful not to choose a colour that is too light as it might be unreadable.

3. Advanced MS Word Skills

3.1 Copy, Cut and Paste

Menu Bar	Highlight the text and right click
	

There are two methods you can use to copy text.

- Menu bar
- Highlight the text and right click

When you copy something, windows places that item in the application memory which is also known as a clipboard.

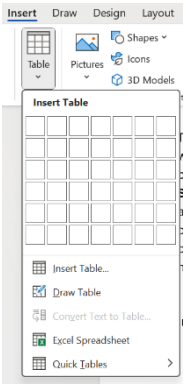
To paste the information, select a location then use either of the above two methods to paste it using the paste command.

The cut option is a little different and is usually used to move an item to a new location. It does the same thing as copy, except that it removes the original item.

3.2 Screenshots or screen captures

This is a very important skill, and it follows on from copy and paste skill. There is a way in windows to take a virtual photograph of what is on the screen and then put that virtual photograph somewhere. There is a key on the keyboard called **Prt sc / PrntScrn / Print Screen** key. When you push this key, then Windows highlights the whole screen and allows you to crop what you want photographed and saves it in the application memory or clipboard. This is called taking screenshot or screen capture. takes a virtual photograph of whatever is on the screen. To place the photograph/image taken, you need to use to Paste command.

3.3 Inserting Tables

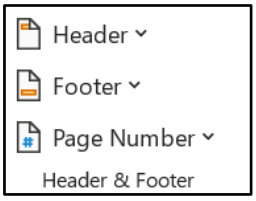


Tables are a great way of organising information in your document. You can use either of two methods to insert a table.

Insert Menu: Click on Insert, then click on the dropdown menu under the table icon and choose the number of columns (blocks going across) and the number of rows (block going down) for your table.

3.4 Headers and Footers:

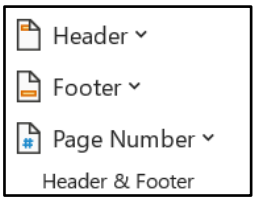
Headers and Footers are a necessary part of a document. Headers and footers let your readers know what the document is for, what its name is, what the information in the document is about as well as what page they are on. A header is a space at the top of the document that holds some of the information and the footer is the space at the bottom of the page that can hold this information.



The most important aspect of headers and footers is that whatever is in the header and/or footer will appear on every page of the document. So, for example, if you put your name in the header, then your name will appear in the position on every page of the document.

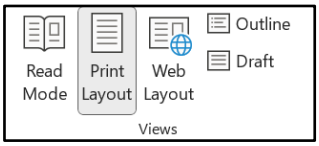
To access this part of the page, select Insert and then Header and Footer. Remember that you can format anything in the Header and Footer sections like you can format any text.

3.5 Page Numbering:



In the previous section you were introduced to Headers and Footers and how you can place numbers and other text in those sections. MS Word also has a feature t quickly insert page numbers. To access the menu, select Insert then Page Numbers. Click on the drop-down menu on the page number, and you can select where you want the page numbering.

3.6 Views of your document:



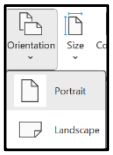
MS Word allows you to have different ways of looking at your document. These can be accessed by selecting View and then the view you want. Here are some of the of the options and what they do:

Print Layout: This is the default view of your document. It gives you a good indication of what your document will look like if it was printed.

Read Mode / Normal: Normal is the view that shows you the page by itself and not how it is in relation to other pages.

Web layout: If you are planning on turning your document into a web page then this view would be the best for you as it shows how the pages will look as web page.

3.7 Page Orientation



MS Word allows you to change the way your page is laid out by allowing you to either have the pages in your document standing upright as you would hold a sheet of paper by its longer sides or on the longer side.

To access the feature, select Layout, the Orientation, then you will see a window with the option of Portrait (upright) and Landscape (on the side).

3.8 Bullets and Numbering

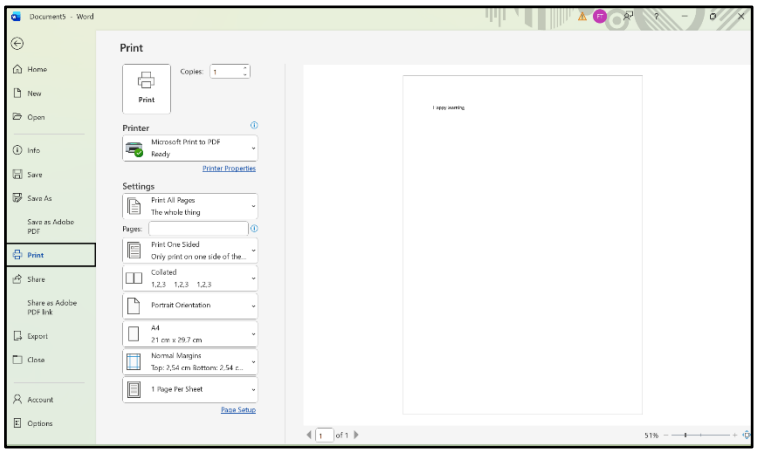
Bullets and Numbered lists are ways to break up and organise information into smaller and easier to read pieces. Here is an example of the wrong way of laying out the steps to create a bulleted list. Type a line, press Enter key, type another line, press Enter key again. Select the lines of the text, select the Bullet button. Instead, I could follow the instructions and create this:

- Type a line
- Press the Enter Key
- Type another line
- Press the Enter key again
- Select the lines of text
- Select the Bullet button

As you can see this is a much better way of presenting a point in a smaller piece of information. You could have done the same with a list and selected the Numbered List button instead and it would look like this:

1. Type a line
2. Press the Enter Key
3. Type another line
4. Press the Enter key again
5. Select the lines of text
6. Select the Number button

3.9 Printing and Print Preview



Once you have completed a document, often you would like to print it. This is the end result of most documents. MS Word has many tools you can use to make the printing more user-friendly so that you get out from your printing what you need. When you click on the File Menu, then Print buttons, you will see printing options and the print preview. Select the Print Button, this will print your document as it is to the printer that is setup on your computer as a default with default settings.

Printer:

If you need to print to a printer that is not the default printer on your computer, then you can select from a list of installed printers when pressing the drop down on the Printer menu.

Number of pages:

Under settings, you can select if you want all pages to be printed or the page you are currently on. The other option here is to enter which pages you want printed. You do this by typing the start page followed by dash (-) then the end page. For example, 3-8 will print pages 3 to 8.

Select number of copies

Here you can select the number of copies to be printed.

Microsoft Excel

4. Using Microsoft Excel

Session 1.5: MS Excel – Introduction and Interface

> **Purpose**
> To introduce Excel as a tool for organising and calculating data.

By the end of this session, you should be able to:

- Navigate the Excel interface (rows, columns, cells).
- Understand the difference between text and number entries.
- Enter data accurately into a spreadsheet.

Session 1.6: MS Excel – Data Entry and Simple Calculations

> **Purpose**
> To build confidence in data entry and basic formulas.

By the end of this session, you should be able to:

- Use SUM, AVERAGE, and basic arithmetic formulas.
- Calculate percentages in Excel.
- Format cells for clear data presentation.

Session 1.7: MS Excel – Basic Charts and Visualisation

> **Purpose**
> To create simple charts for routine reporting.

By the end of this session, you should be able to:

- Select appropriate data for a chart.
- Create a bar or line chart with labels and title.
- Understand that one chart = one message.

Session 1.8: MS PowerPoint – Basics

> **Purpose**

> To introduce PowerPoint for communicating information.

By the end of this session, you should be able to:

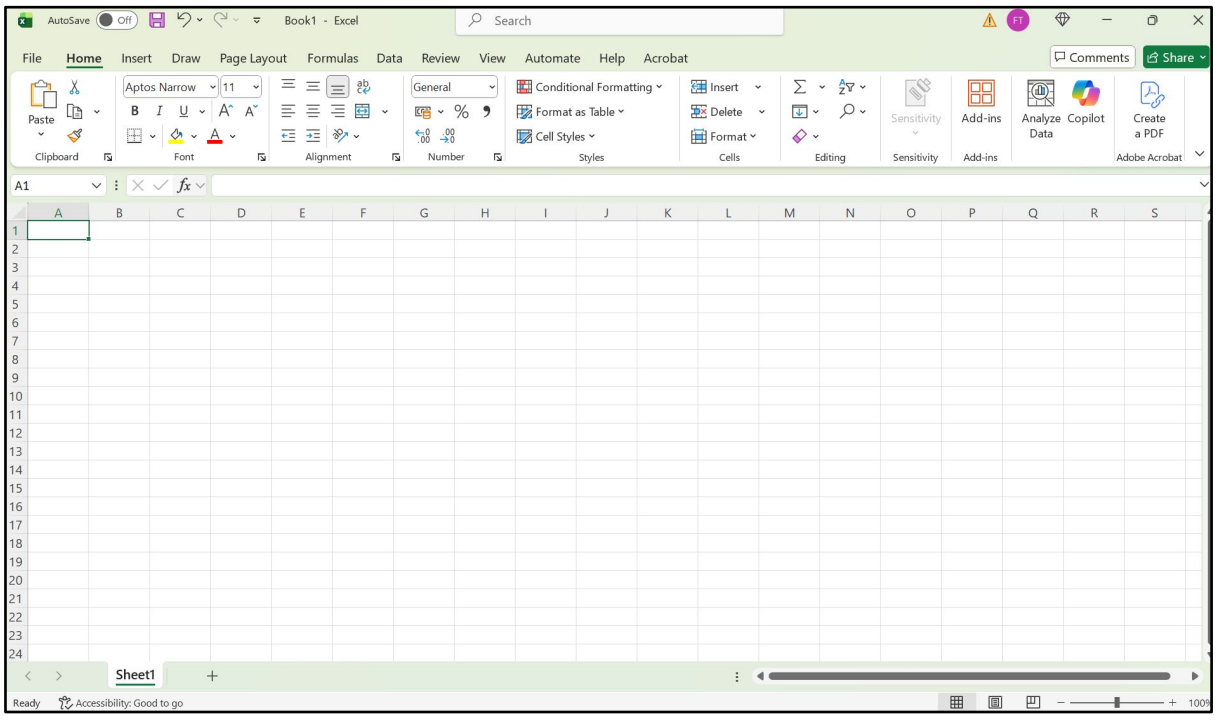
- Create a simple presentation with text and images.
- Keep slides clear and minimal.
- Understand that slides support the speaker, not replace them.

4.1 Opening the Application:

MS Excel can be opened in the same ways as MS Word.
Start Menu;
Here you select the Start Button and click Microsoft Office Excel
Icon; if there is a shortcut on your desktop then double click on it to run the application.

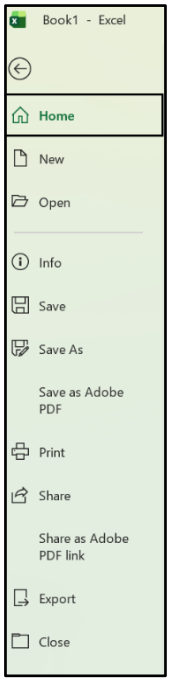
4.2 Basic MS Excel Interface and what a spreadsheet is:

A spreadsheet is a very different type of application than a word processor. A spreadsheet application organises information into columns and rows. Each column is labelled with a letter from the alphabet, and each row is labelled with a number starting at 1. Where a column and a row cross each other is a block, this block is called a cell and can be found by using the letter and number system. The cell A1 is the very first cell in the top left-hand corner of a spreadsheet because it is the cell where the row 1 crosses the column A. here is an example of an empty spreadsheet.



As you can see the cell A1 is selected it has a dark border around it. The cell indicator tells you which cells you have selected.

Menu Bar, Tool Bar and Formatting Toolbar:



MS Excel ha a Menu Bar that looks very much as the same as the Menu Bar for MS Word. You will see this happening in all MS Office applications.

The Tool Bar for MS excel also looks very the same as that of the MS Word and works I the exactly the same way. Many of the options available in the Menu Bar are available as single click in the Tool bar. Here is a summary of some of these buttons on the Toolbar.

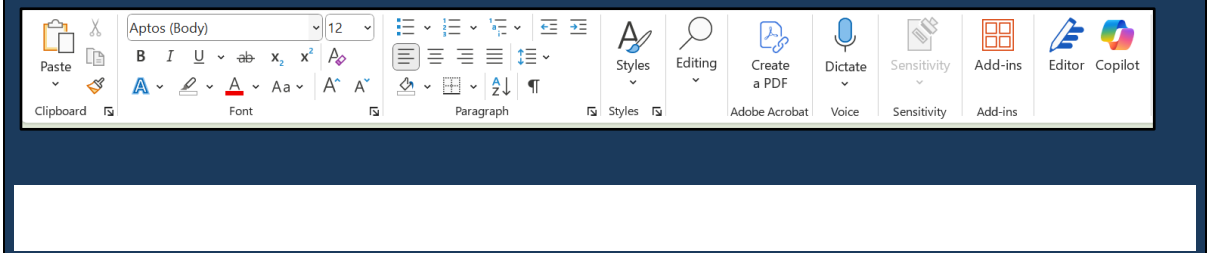
- Create a new spreadsheet

- Open an existing spreadsheet

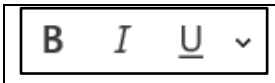
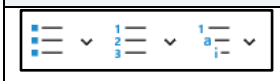
- Saves your spreadsheet that is open. Note that it will try to Save As if the spreadsheet has not been named already

Here are some functions on the Formatting Toolbar:

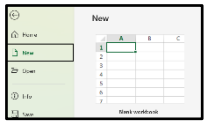
This bar of icon is used to format cells in MS Excel. To format cells using these tools selected the cell or range of cells that you want to format and use the tool.



Aptos (Body)	Font Type: to access the list of fonts you can either select the words or the drop down arrow. This will give you a list of fonts to choose from to format your selected text in cells with.
12	Font Size: this drop down list allows you to choose a size for the text in cells that you have selected.

	Bold, Italic, Underline: these buttons allow you to change the selected text in cells to any of these options. Note: you can add all the options to one piece of text. Once the button is selected it stays pressed in. To take the option off the selected text, press it again.
	Text Alignment: these icons allow you to align text in a cell to either left, centre, or justified in a cell
	Bullets and Numbering: These two icons allow you to either bullet or number a set of selected text.
	Text Colour: this icon allows you to change the text colour of selected cells
	Merge Cells and centre text: this button allows you to merge your selected cells into one cell and then centre align the text in the merged cell.
	Fill colour: this button fills the selected cells with a colour you can select from the drop down arrow.

4.3 Creating New Workbooks/Spreadsheet:



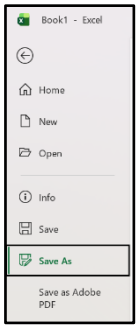
In MS Excel a spreadsheet is one sheet as shown in the interface image above. A workbook is the actual “document” that you have open. A workbook is a collection of spreadsheets. To create a new workbook you can do one of two things:

File:
New
Blank Workbook

It is important to keep in mind that when you open MS Excel than it automatically creates a default workbook called BOOK 1. If you create a new workbook then it will be named in sequence with that first default book. In other words if your default book is called Book 1 then the next workbook that you create will be called Book 2.

4.4 Saving Workbooks:

As mentioned before, when you open Ms Excel it creates a default workbook called Book 1. As soon as you try and save this workbook it will give you the option to rename this workbook. There are three options when saving a workbook:

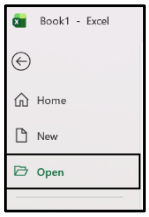


Option 1: Default Saving (The First Save). This happens when you save the default Workbook named 1.

Option 2: Normal Saving: (Saving, changes made to a workbook). This happens when you have named your workbook and you press the Save button or File- Save option.

Option 3. Saving As. (Creating a copy and changing the name of the workbook). This option allows you to rename your Workbook. You are presented with the same options a when you attempt to save the default workbook. If your workbook is named something other than the default name then selecting the Save option will show you nothing, it will just save your workbook the following window appears.

4.5 Opening Workbooks:



When you select the Open option either from the File menu or the con then you will be presented with a window that allows you to browse and find a workbook that exist in your storage space.

The Open workbook interface looks very much the same as the Save As window. It allows you to browse to storage spaces and devices in the same way as the window. The big difference here is that when you select an MS Excel file and press the Open button (it will become available when you select a file), MS Excel will open the workbook for you. If the file is inside the folder double-click on the folder to enter it and look for the file.

4.6 Closing Workbooks and MS Excel:

All the Microsoft Office applications have two methods to close both the workbook (window) and the application itself.

Closing the Workbook:

You can either use the File menu and select Close to close the current workbook or you can select a cross at top right-hand side of the window below the bigger red button with a white cross. You must be aware of the following:

If a workbook has not been saved, then closing the workbook will allow you to do so. MS Excel will ask you if you want to save the workbook as shown in the image. If you select No, then you will lose all the changes you had made since you saved the workbook last. If you select Cancel, then it will stop the closing of the workbook.

Closing the Application:

You can select the cross in the top right-hand corner which turns red when you get the cursor onto it. Note: if you have any workbooks open that have not been saved then MS Excel will give you the option of saving them.

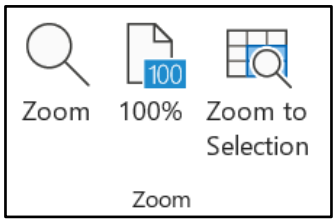
5. Using a Spreadsheet

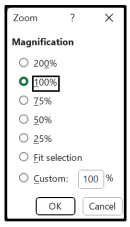
5.1. Using Zoom

Certain spreadsheets that you will be working with will have so much information in them that the creator of the spreadsheet has had to "zoom out" of the standard view to see all the data. It is important that you also know then how to zoom back into the standard view. The default view of a spreadsheet is at 100%. The bigger you make this number the more you will zoom in. The smaller you make this number the more you will zoom out. To access the Zoom features, you follow these steps.

- Select View-

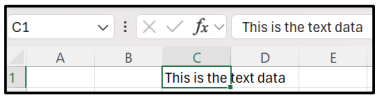
- In the zoom menu, select the Zoom and select amount that you need

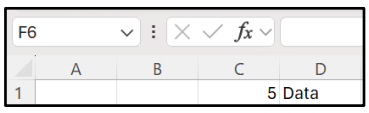




5.2. Entering Data and Text:

As mentioned before, using a spreadsheet is not at all like using a word processor. In a word processor it did not matter if you used the text or numbers but in spreadsheet it does. To enter either number or text into a cell you must select it first. Remember that the cell you have selected will be shown in the cell indicator box. In the image shown Cell C1 is selected. To enter numbers or text, just start typing. You will see that what you are typing appears in **two** places as you type. The first place is the formula bar. This is showing you what you are doing when you are **editing** a cell. The second place is the cell space itself that is





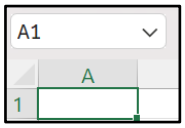
showing you what you type. Once you have finished typing in text or numbers you can press enter to move to the next cell.

Note: this is very different to a word processor where the Enter key moves you a line down. Type text in one cell and a number in another. You will notice that the spreadsheet handles the two different types of information very differently. For a start it places the number on the right-hand side of the cell and the text on the left. It is important to realise that a spreadsheet uses text and numbers in different ways. In a spreadsheet text is there only to create sense out of numbers. Numbers are what a spreadsheet is made for. In a spreadsheet you can add up numbers in different cells and do many other more interesting and complex calculations with them as we shall see.

5.3. Selecting Cells:

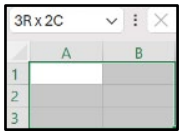
As you have started to see, a spreadsheet uses cells to keep information in them. One of the most important skills to learn in a spreadsheet is how to select cells. MS Excel offers a variety of tools to select cells, from the very easy to the more complex. Here are tools you have to know to select cells in a spreadsheet:

Selecting a single cell:



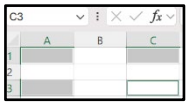
To do this use your mouse cursor and select a cell. As you have seen before the cell reference will be shown in the cell reference box.

Selecting more than one cell that are adjacent to each other:



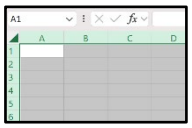
Here you must be able to select cells that are next to each other in any direction. To do this select the starting cell and then hold left mouse button down and drag a selection box around the cells you want to select. You will see now that the cell indicator box does not tell you which cell you are in since you have selected more than one. It does tell you that you have selected a space that is 3 rows and 2 columns big: 3R x 2C.

Selecting more than one cell when the cells are not next to each other:



As you can see in the image, here are 4 cells that are selected (in grey) that are not next to each other. This is called a multiple selection and can be done by using the control key (Ctrl) on your keyboard. Select the first cell, hold down the control key and select the next cell you need with the left mouse button while still holding down the control key. Keep holding the control key down until you have selected all the cells you need.

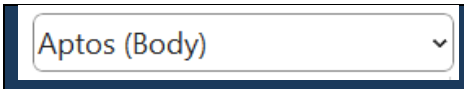
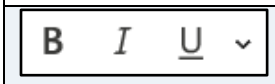
Selecting the whole spreadsheet:



Sometimes you will need to select the whole spreadsheet. To do this select the block that is just before the A and before the 1, the first little block in the spreadsheet at the top left-hand corner. If you select thus block then the whole spreadsheet will be selected, all the cells.

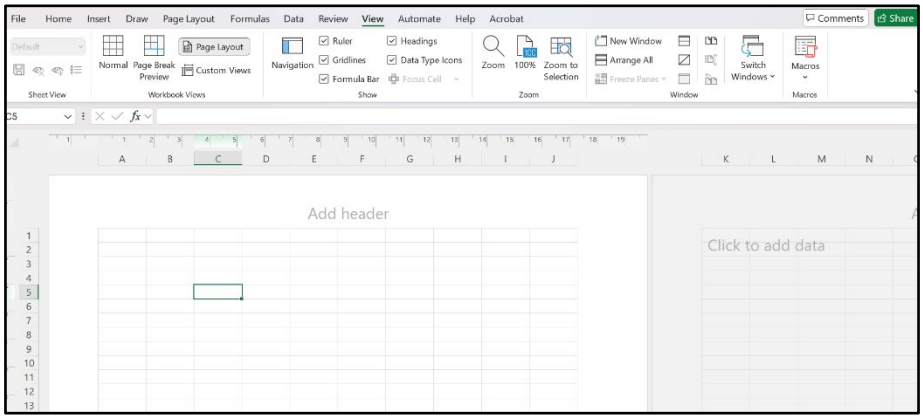
5.4. Formatting text and numbers in cells:

In a previous lesson you were introduced to the formatting toolbar in MS Excel. It looked much the same as the formatting toolbar in MS Word You can format text in MS Excel using that toolbar the same way as you can in MS Word. Here are some of the formatting you should be able to do on text and numbers in cells.

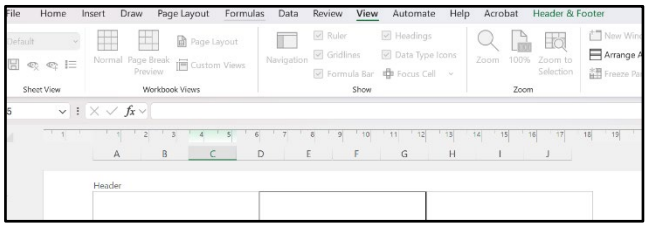
	
	Font Size: this drop-down list allows you to choose a size for the text in cells that you have selected.
	Bold, Italic, Underline: these buttons allow you to change the selected text in cells to any of these options. Note: you can add all the options to one piece of text. Once the button is selected it stays pressed in. To take the option off the selected text, press it again.
	Text Alignment: these icons allow you to align text in a cell to either left, centre, or justified in a cell
	Bullets and Numbering: These two icons allow you to either bullet or number a set of selected text.
	Text Colour: this icon allows you to change the text colour of selected cells
	Merge Cells and centre text: this button allows you to merge your selected cells into one cell and then centre align the text in the merged cell.
	Fill colour: this button fills the selected cells with a colour you can select from the drop-down arrow.

5.5. Headers and Footers:

The header and footer menu in MS Excel is a little different to that of MS Word. To access the header and footer select View, and under the Workbook view group, select page layout. The add Header column will appear.



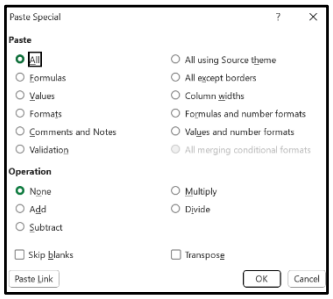
In MS Excel the header and footer are split into three sections for each: left, middle and right. To have text appear on the left hand side of the Excel "page" you must place the text in the left section and in the right section if you want text to appear on the right. The headers and footers are also different to MS Word because you cannot see them while you are working on the spreadsheet. You can only see what is in the header and footer if you use the Print Preview button.



Place text into the columns and the header or footer will appear on the menu bar. Once you are in the header or footer creation window you must decide where the text will appear in the header or footer. This interface also contains the same tools that you had access to in MS Word to place Page Numbers etc in the spreadsheet header and/or footer.

5.6. Copy, Cut and Paste

The Copy, Cut and Paste buttons and functions work the same way as they work in every MS Windows application. These functions place information into the clipboard of application and then allow you to paste them somewhere else. You can even paste between applications in this way. Top copy or cut something from MS Excel, select the cells that you want to copy information from and then either use the copy function or cut function from either the File menu or the toolbar. Select the destination cell or cells and select paste.

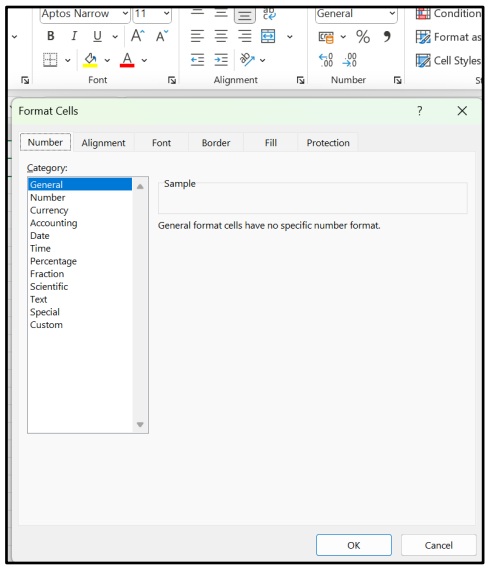


MS Excel has more use for the function: **Paste Special** than MS Word. This function allows you to choose from a selected range of cells what you want to paste. As can be seen from the image there are a lot of options. One of the most popular is the Formats option. Here MS Excel will paste the format of the selected cells to another cell and not the contents. This is useful if you want to transfer the full formatting of a range of cells to other cells.

6. Using Spreadsheet Skills

6.1 Formatting Cells

The are two options to access the formatting of cells, either on the menu bar or by selecting a cell and right clicking on the same cell.



To start formatting the contents of a cell, select the cell or cells first. Note that the formatting you choose will be applied to all the cells that you have selected. There are six (6) tabs in this interface. We will look at 3 of them

Number tab:

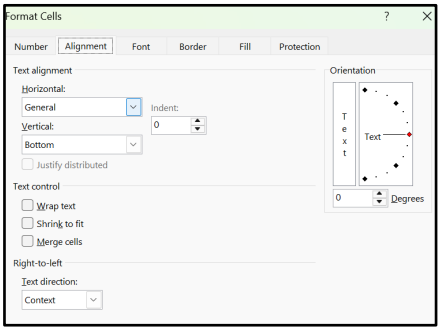
This tab allows you to format the way the numbers in cells are displayed. Most of the options in the list have more options on the right-hand side once you have selected an item.

If, for example, you wanted to ensure that the cells you have selected should display numbers that have 2 decimal places then you would select the Number option and then select the decimal places to two (2). The number option always allows

you to choose if cells will display negative numbers in red and if the thousand separators will be used.

- If you wanted to have cells display their contents as financial units in currency, then you would select the Currency option and set the kind of currency you would want to use. If your computer has been set up as being a South Africa computer, then the Rand symbol will be the default.

Alignment tab:



The alignment tab has many options in it but most important one is the Wrap Text option. If this is selected, then all the text in the cell will be wrapped so that when you select that cell you can see all text that is typed in it, and you don't need to increase the column width.

Border tab:

The border tab allows you to add border to the selected text. You can select which side of the cell will get a border or you can select from the pre-made selection. You can also choose the colour of the border as well as the thickness of the border

6.2 Mathematical Operators:

Since the spreadsheets uses numbers and does calculations with them it also uses mathematical operators. These are basically the symbols used to do mathematical formulas. Here is the list of the most used ones:

*	This is the symbol for multiplication. You cannot use the normal "x" since this is the same as the X letter. So, a formula that multiplies 5 ad 3 with each other in MS Excel would look like THIS: =5*3
/	This is the symbol for division. A formula that divides 6 by 3 will look like =6/3
+	This is the plus symbol and used for addition =9+1
-	This the minus symbol and used for subtraction =14-3

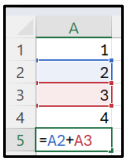
Mathematical Order:
When using these mathematical operators, you must keep in mind that there is a universal rule about what to evaluate first if a formula contains more than one of the above operators.
The rule of BODMAS applies here:
Brackets, **O**rders, **D**ivision, **M**ultiplication, **A**ddition, **S**ubtraction

It means that the formula: =6+2*3 will be shown as 12 since Excel will do the multiplication **first** (2x3) and then add the 6 (multiplication is done before addition according to the order given in

BODMAS). To ensure that excel calculates the formula in the right order use **brackets** to show the order priority.
The above formula would have been better ordered by typing it as =(6+2)*3

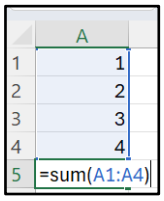
6.3. Using Formula:

As you have seen in the previous point, a formula in MS Excel is always started with an = sign. This is always used because MS Excel then knows that it is working with a formula and not just text. If you had entered the text: (6+2)*3 in a cell in MS Excel hen the cell would have displayed the exact text, you have entered. If you place an = symbol in front of it. The application will do the formula for you and give you an answer in the cell instead.



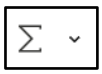
The real power in the MS Excel lies in the fact that it can perform mathematical formulas on the cells. It contains that have numbers in them. Look at the image. Here are there 4 numbers placed in one 4 cells, the cells are A1, A2, A3, A4. In A5 there is a formula that reacts =A2+A3. When you press enter after typing in that formula MS Excel will place the results of the formula in the cell called A5. The result will be 5.
Ask yourself this: what formula would you have used to add up all the numbers from A1 to A4?

Answer: =A1+A2+A3+A4, which would have given you 10. You can now see how you can use any of the mathematical operators discussed above to create formulas. Another example would be =A1+A2*A3. According to BODMAS order rule, the answer would be 7. Not only can MS Excel use mathematical operators, but it also has a wide range of functions built in to make your formula easier. There are only two that you need to know at this stage and they are:

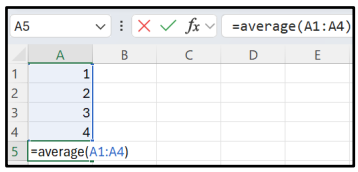


SUM: This function allows you to add up the numbers in a range of cells. To use this function all you need to do is to select a cell range is taken from the start of the range of cells that you want to add up to the last cell and is written using the"-:" punctuation mark or two full stops"..". Instead of typing in =A1+A2+A3+A4 from our earlier example, you can type in_=sum(A1:A4) and you will get result MS excel goes one step further and makes it even easier for you to select the range of cells. After you have typed in =sum (you can use the mouse to select the cells that you want to use.

Autosum:

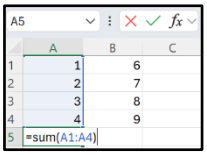


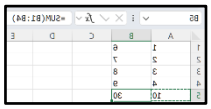
Autosum is another way to get the same result, an even easier one. Select a cell that will hold the result of the formula, then select the AutoSum button on the toll bar, then select you cell range.



Average: The second function that you need to know is the Average function. If we had use a normal mathematical formula to calculate the average of the cells A1 to A4 we would have to add all the values up and then divide the result by the number of cells, as shown in the image. Instead, we can use the Average formula. The Average formula looks

like this: =Average (cell range). This will provide the average for a cell range. This is what it looks like when implemented in our example spreadsheet image.





Copying and pasting formulas: In the example shown you can see that there is a formula in place for row A. If you wanted the same formula for row B all you need to do is copy cell 5 and paste it into cell B5. This will copy the formula into the new cell. Think about this for a minute. If the original formula was =SUM (A1:A4) would it not copy the exact same formula to cell B5? When you copy and paste the formula you will notice that it looks like the image. What has happed here? It looks as if MS Excel has changed the formula to add the numbers in a row B.
This feature is called **relative addressing**. This means that MS Excel will change the contents of a formula that is pasting to fit **relative** to where it is going. It makes life a lot easier this way.

6.4. Recognising Formula Errors:

You will come across Formula errors at some point. When you have entered something incorrectly in a formula, Excel will give you an error message. You can use an error message to correct the problem. Here are some of the error messages you can encounter and what to do about them.

Message	
######	The Contents of the cell cannot be displayed correctly as the column is to narrow
#REF!	Indicates that a cell reference is invalid. This often displayed when you delete cells that are involved in a formula.
#NAME?	Excel does not recognise text contained within a formula
#VALUE?	One of the arguments in your formula is the wrong kind of value. You could be using a text value where you should be using a number.
#DIV/0	The formula is trying to divide by 0. Check to see if one of your arguments in the formula is 0.
#NUM	One or more than one of the number arguments are not valid

6.5 Calculating Percentages and using Absolute Addressing:

One of the kinds of calculating that you will be doing a lot of is the calculation of percentages. You will be presented with a range of figures then asked to calculate what percentage of another number those are. Let us look at a very simple example:

	A	B	C
1	Types of fruits	Number of fruits	Percentage
2	Apple	100	
3	Banana	50	
4	Orange	70	
5	Pear	80	
6	Total	300	

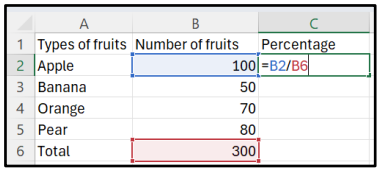
If you have to work out what percentages of Apple's, you would have to look at the spreadsheet and ask yourself: what percentage the number in cell B2(100) is of the total number (300). To do this you would have to divide 100 by 300 then multiply the result by a 100 to get the percentage. Let us look at how we would achieve this using a spreadsheet. You can follow along with these steps in your spreadsheet:

Step1:

Select Cell C2

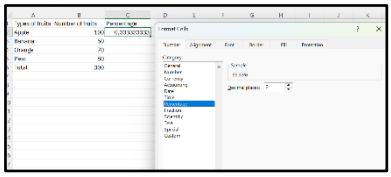
Step2:

Enter the formula to work out the percentage. It would look like this=B2/B6. I can see you are already asking yourself: what about the multiplication by 100? Well, there way to make MS EXCEL look at that cell as a percentage.



	A	B	C
1	Types of fruits	Number of fruits	Percentage
2	Apple	100	=B2/B6
3	Banana	50	
4	Orange	70	
5	Pear	80	
6	Total	300	

Step 3:
Right click on cell C2. Select format cells. Select Percentage. Select Ok. Remember the section in this lesson on formatting cells? This is one of the functions found under the Format Cells menu under the Number tab.



So now you can see that 33.33% of all fruits are Banana's. Now the question is: can we workout the percentage of the rest of the fruits? Follow these steps in your spreadsheet:

Step 4:
Select cell C2, select copy, select cell 3 and select paste.

You will see that you get an error message (#DIV/0). From the table earlier you should now know this means that one of the arguments is trying to divide a number by 0. With cell C3 selected take a close look at the Formula Bar. You will see that the formula reads =B3/B7. What is in cell B7? Yes, you are right, nothing. Why did MS Excel change the formula to read B7 instead of the total number cell B6? This is the concept of relative addressing.

Step 5:

To make sure that Excel does not change the important cell reference (B20) you must now apply **absolute addressing** to the formula. This will force MS Excel to leave the cell reference that you set in absolute addressing alone and it will not change it.
In the formula bar change the formula =B3/B7 to B3/B6. The "$"symbol will now force MS excel to use the B6 reference every time when you copy and paste this cell. The F4 key can also be used to insert the $ signs. Just click your mouse pointer before B6 and press F4 and signs for absolute addressing would be inserted.

Step 5:

Format the cell as a percentage.

Step 6:

Copy and paste cell B3 to all the cells down the row. To do this easily, copy cell C3, select all the other cells down the row up to cell C5 and select paste. Select all the cells from cell C4 to C5 and right click, select Format Cells, select Percentages, select OK. Now you can easily see the percentage from the table.

Remember: Absolute addressing must only be used if formulas are copied and one or more of the cell addresses must <u>not</u> be changed in the copying process.

7. Using Advanced Spreadsheet Skills

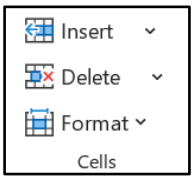
7.1 Column /Row size modification

There are two methods you can use to increase or decrease the width and heights of the columns and rows.

Using the Mouse

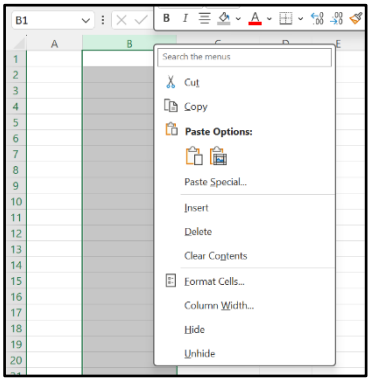
The first method is to use the mouse. To increase the widths of a column, select the line between two columns with the mouse. You will see the cursor change from an arrow to a line with two arrows going right and left from it. Hold the mouse button down and drag the column to the right or left to increase or decrease the column size. You can do the same for the row height. Select the line that separate two rows and click and drag. It does the same thing but up and down rather than left and right.
You can also make the column go wider or smaller to automatically fit the contents of the column or row. To do this you move the mouse cursor to the line separating two columns or rows. Once the cursor changes; double click the left mouse button. This will then automatically fit the column or row to be just big enough to fit the content of it.

Inserting Column and Rows



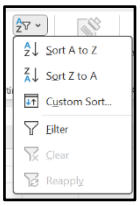
You can insert a column or a row in a spreadsheet using a range of tools. You will need to do this in your work. Many times, you will need to insert new data into an existing spreadsheet, and this is the way to do it. To insert a column, select a column and the select insert–> Column. The same can be done for a row, select the row, select Insert-> Row. You can also use the right mouse button menu to insert a row or column.

Hiding Columns and Rows



You will most certainly encounter very large spreadsheet. You will also need to work with some information on a spreadsheet. and other information. One tool you have that will enable you to do this is to hide information that you do need to work on. To hide a column or row you select the column or the row; then either use the right click menu to hide it or select Format-Row/Column-Hide. To unhide a column or row select the two rows or columns on either side and then go through the same procedure and choose Unhide.

7.2 Sorting Data:



Another feature that MS Excel has to help you sort through large amounts of information is to sort the data. This allows you to rearrange the information in the spreadsheet by certain requirements. **Note**: this will be mentioned a few times in this section: sorting a row of data does **NOT** sort all the data that is related to it. This means that if you select one column in a table and you sort it, the data on this can lead to your table holding information incorrectly.

The toolbar contains two sort buttons that will sort selected data. MS Excel will automatically use the type of information in the selected columns as the requirements.

Sorting Ascending sorts the selected information from lowest to highest.

Sort Descending sorts the selected information from highest to lowest.

If these cells contained words, then these two sort buttons would sort the words alphabetically according to the first letter of the words. There is a more in-depths tool for sorting data. To access it select the data you want to sort and then select Data-Sort.

This interface allows you to sort by more than one row in your in your selection and here you can also select Ascending or Descending on different columns. You can select an option that makes the top row of your selected data as a header row or not. If you select the top row or not. If you select the top row as Header Row then the options in the drop-down list will contain the names of the from

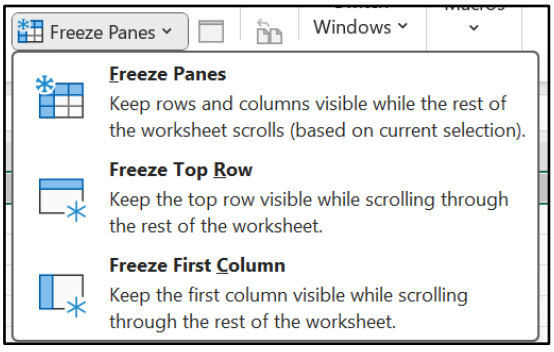
the header row. Note: sorting selected data will not automatically sort the other data in a table. It is always a very good idea to select a whole table of information to sort out.

7.3 Multiple Sheets:

You will remember that in the beginning of the spreadsheet lessons that MS Excel opens a workbook. A workbook is a collection of spreadsheets, which means that there are more sheets than the one you see as you open the workbook. To access the other sheets look down all the bottom of the interface. Here you will see that your workbook has one sheet in it, click on the plus + sign twice, then you will see sheets named Sheet 1, Sheet 2, and Sheet 3. Click on the sheet that you want to see.
The one you are working on by default is called Sheet 1. To change to the other sheets select them here. Right click on any of these sheets and look at the right click menu.
The options need to know about are:
Insert: These allows you to insert a new sheet which will increase you default number from 3 to 4 sheets
Delete: This allows you to delete sheet that you have selected. Keep in mind that this will delete all the information in that sheet.
Rename: This is the option that you will most probably make the most use of. Here you can rename your sheet from sheet 1 to a name that makes sense. It is always good a good idea to rename you default sheet to make sense or to describe the information you are working on. If you are working on data for HIV infection in 2005 then it would a good to rename the sheet to something like: HIV infection 2005. Another method you can use to rename the sheet is to double click on the sheet name.
Move or Copy: This allows you to move or copy the sheet same workbook or to another workbook

7.4 Freezing Columns and Row Headings:

As mentioned, before you will be using spreadsheet with very large amounts of information. You have covered some tools that MS Excel offers that will help you manage all the information. Freezing columns and Row headings is another one of these tools.

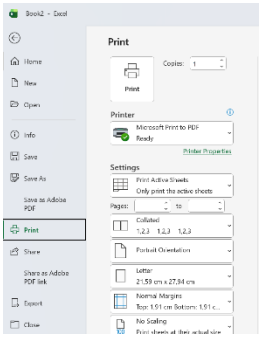


When you freeze the column or row heading, you are making it stand still on the screen when you scroll across or down on the sheet. One very useful way to use is to make sure that the column headings are frozen as you scroll down the information. You can now see what data is for when the heading stays on the screen. To freeze a row like this, select the cell where the information will change. Select Windows- Freeze Panes. The cell just above your selected cell will now stand still while the

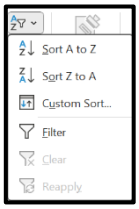
rest will scroll as you move through the sheet: To take the Freeze away, select Window- Unfreeze Panes.

7.5 Printing:

As in MS Word, you can do output on your spreadsheet by printing it. As you have seen, the sheets can be very large. It is for this reason that the printing options are a lot more complex than for a document. One of the most important functions in the printing is not really found under the printing interface.

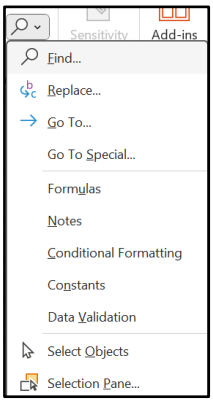


7.6 Filters, AutoFilters:



Filters and AutoFilters are another set of tolls that MS Excel provides you to filter through the large amounts of information that you will be working with. Before you start a filter select the title row of information that you will need.
To enable the AutoFilter go to editing click on sort and filter, then select Filter. This action will apply drop-down arrows to column labels in your big data sheet. You can then select a specific value from one of the drop-down lists to display only the records in the column containing that value. This means that you can narrow down the information that you see drastically. **Note**: the information that is not shown is not gone. It is simply hidden. You can disable the filter by using the same menu commands. NOTE: It is a very good idea to ONLY apply a filter to one column at a time, doing a filter on more than one column will lead to very confusing results.

7.7 Find and Replace:



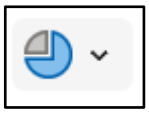
Another tool that MS Excel has to find information in large spreadsheet is the Find function. This allows you to search for specific information in a spreadsheet. You can even replace information in this way.

Note: to find information you must enter it exactly and correctly. The interface does not understand spelling errors. For example, if you search for the word “People” and you enter “peple” instead then you will not find word in your spreadsheet.

7.8 Introductions to Graphs

Up until now you have only worked on umbers and text in a spreadsheet. MS Excel has to take numbers and turn them into a visual medium. You can create graphical representations of information. This way you can draw conclusion much easier from information than you were able to do before. MS Excel will attempt to automate the chart creation process as much as it can. This means that you will not always get information in the way you need it. Luckily MS excel allows you to format and edit graphs as well. Here are some of the most popular chart types and what they are used for:

Pie Graph: This kind of chart takes information and shows you to how they are related to the whole. It basically draws an image of percentages-based information. If you want to see what something is a percentage of total, then this is the type of chart you will see.



Column and Bar chart: This kind of chart looks at how information is related to each another. These two types of graphs are the same except that a column chart has the information bars standing upright and the bar chart has these bars lying on their sides.

Line Graph: This kind of chart plots a progression of data. In other words, it shows you how information changes over time or any other requirements.

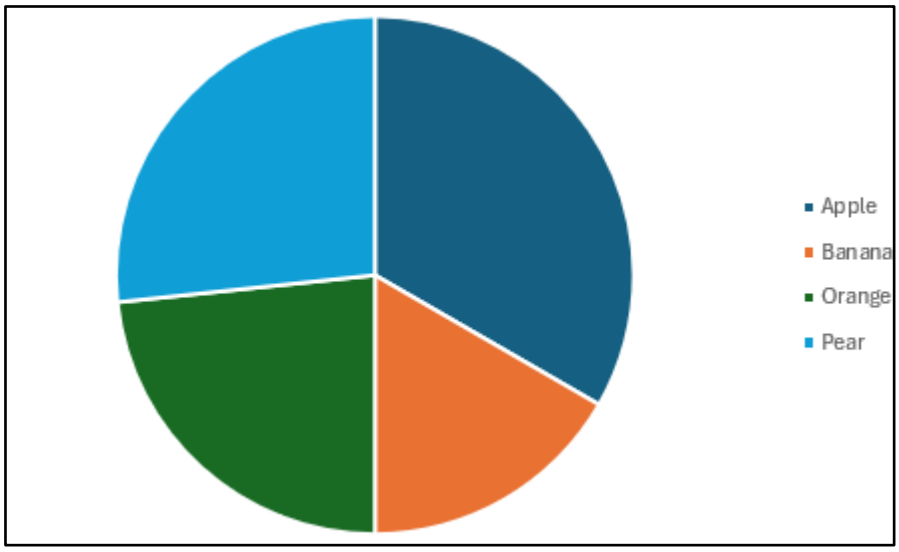
7.8.1 Using Graphs

To start the process of creating chart you must first select data series. This means that you must select the right set of cells that MS Excel must use to create your graph. Let us take a look at the types of series you need to select to create the different chart types:

Pie Graph:

	A	B	C
1	**Types of fruits**	**Number of fruits**	**Percentage**
2	Apple	100	33%
3	Banana	50	17%
4	Orange	70	23%
5	Pear	80	27%
6	Total	300	100%

Here we use the example of fruits in getting a Pie graph. Remember that the pie chart needs to work out what percentage a number is of the whole then present it in an image. To do this it needs to know what range of the numbers it should use and what labels it must add to this range in the image. In the image above, you can see the cells B2 to B5 are selected. We want to see a chart of the fruits. Cels A2 to A5 are also selected so that we have some labels that will help us make sense of the displayed information. To get the process started, select the Chart Wizard button,. Next select the chart that you want to use.



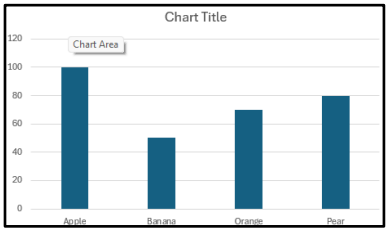
Once the pie graph is displayed, you can click on Add chart element, quick layout and so forth to progress to the next step of designing your graph. On the add chart element drop down, you can chart title to add a name to your chart.

Once all this is done, you can simply analyse the graph to see which fruit is the most.

Bar or Column Graph:

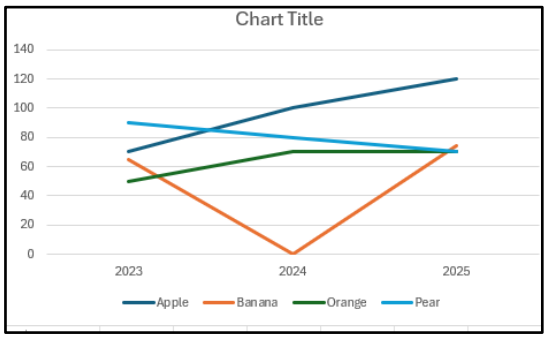
	A	B	C
1	**Types of fruits**	**Number of fruits**	**Percentage**
2	Apple	100	33%
3	Banana	50	17%
4	Orange	70	23%
5	Pear	80	27%
6	Total	300	100%

Using the same data, we now opted for the bar or column graph. You will mostly use a bar or column graph to compare information series with each other.



Line Graph

	A	B	C	D
1	**Types of fruits**	**2023**	**2024**	**2025**
2	Apple	70	100	120
3	Banana	65	0	74
4	Orange	50	70	70
5	Pear	90	80	70



The line graph is more complex than the others and it requires a much more careful use of the wizard to get meaningful results. The series that is selected will attempt to show how units sold were since 2023 to 2025

7.8.2 Modifying Graphs:

Once a chart is made, you can modify almost every part of it. You can either double click on the part you want to modify, or you can single click to see the right-click menu. In this way you can modify bar colours, fonts, effects data labels etc.

Microsoft PowerPoint

Introduction to PowerPoint

Session 1.8: MS PowerPoint – Basics

> **Purpose**
>
> To introduce PowerPoint for communicating information.

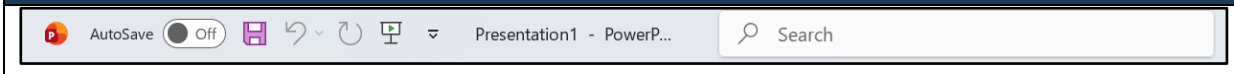
By the end of this session, you should be able to:

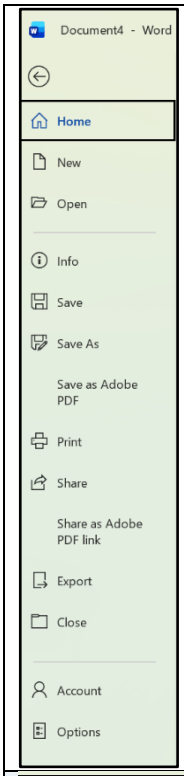
- Create a simple presentation with text and images.
- Keep slides clear and minimal.
- Understand that slides support the speaker, not replace them.

8.1 Introducing PowerPoint:

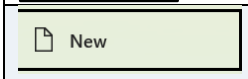
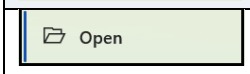
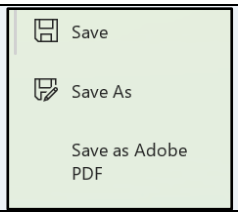
MS PowerPoint is another tool in the MS Office suite. PowerPoint is used as a presentation application. This means that for the most part PowerPoint is the application that the people use to present information to another group of people, It is very graphically oriented application and uses many graphic tools. You will soon notice that it uses the exact same formatting options that MS Word and MS Excel uses.

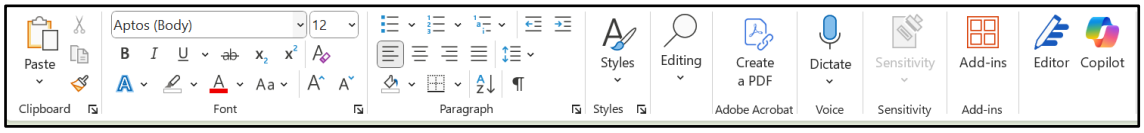
8.1.1 PowerPoint Interface

Interface Item
 **Title bar:** The title bar in the MS PowerPoint tells you which application you have open as well as the name of the presentation. When you open MS PowerPoint, it has a presentation open already which is called the Default Presentation and it is named Presentation 1. If you create more presentations they will be names Presentation2, Presentation3, etc.
 **Menu Bar:** The menu bar functions in the same way as most other menu bars. Each option can be accessed by selecting it, which will display a **drop-down menu** containing additional commands and features



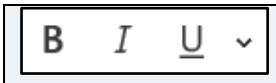
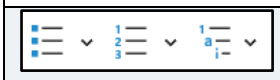
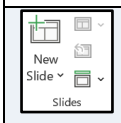
Standard Toolbar:
The Standard toolbar contains icons that provide quick access to many commonly used commands. These icons perform the same actions that can also be accessed through the **Menu Bar**.
Below is a more detailed description of some of these icons and their functions.

	**New Presentation:** This icon creates a new blank presentation.
	**Open Presentation:** This icon opens an existing presentation.
	**Save Presentation:** This icon saves the current presentation. If the presentation has not been named yet (for example, if it is still called presentation *1*, presentation *2*, etc.), you will be prompted to enter a name before it is saved.



The Formatting Bar: This bar of icons is used to format items in MS PowerPoint. To format an item using these icons, select the item then press the icon. The exception to this action is the Font type, Font size, and Font styles. These are accessed by selecting the drop down arrow next to the icon.

	Font type: To access the list of fonts available you can either select the words or the drop down arrow. This will give you a list of fonts to choose from to format your selected text.
	Font Size: This drop down list allows you to choose a size for the text that you have selected

	Bold, Italic, Underline: These buttons allow you to change the selected text to any of these options. Note: You can add all the options to one piece of text . Once the button is selected it stays pressed in. To take the option off the selected text, press it again.
	Text Alignment: These icons allow you to align text to either left, right, centre or justified.
	Bullets and Numbering: These two icons allow you to either bullet or number a set of selected text.
	Text Colour: This icon allows you to change the colour of the selected text.
	New Slide: This button allows you to insert a new slide in the MS PowerPoint
	Design: This button allows you to choose the slide design of the slide.

8.2 Creating New presentation

You can create a new presentation by clicking on File menu and clicking new. Once you create a new presentation, you will notice that it names it in a numerical sequence. By default MS PowerPoint creates a new presentation when you open the application and it is called Presentation 1. When the second presentation is created, it will be named Presentation 2.

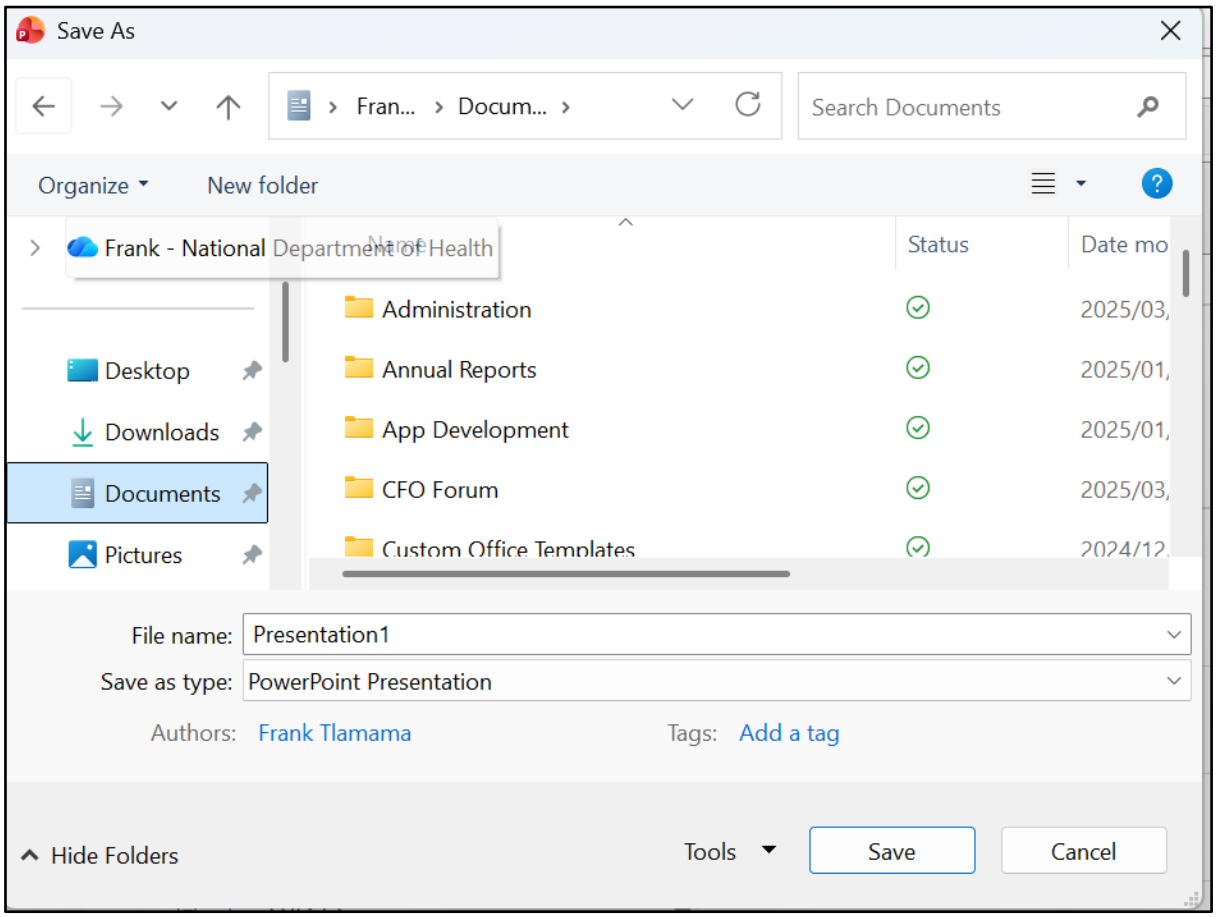
8.3 Saving Presentations

The are three options when saving a presentation
Option1: Default saving is the first save: This happens when you save the default presentation named Presntation1

Option 2: Normal saving: Saving changes made to the presentation. This happens when you have named your presentation and you press the save button.

Option 3: Saving As: Creating a copy and change the name of the presentation. This option allows you to rename your presentation. You are presented with the same options as when you attempt to save default presentation. If your presentation is named something other than the default name, then selecting the Save option will show you nothing, it will just save your presentation. If you are

working on the default presentation or if you are attempting to rename your presentation, the following will appear:

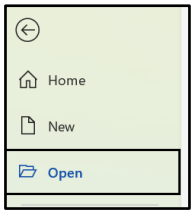


The labels in the interface refer to the following:

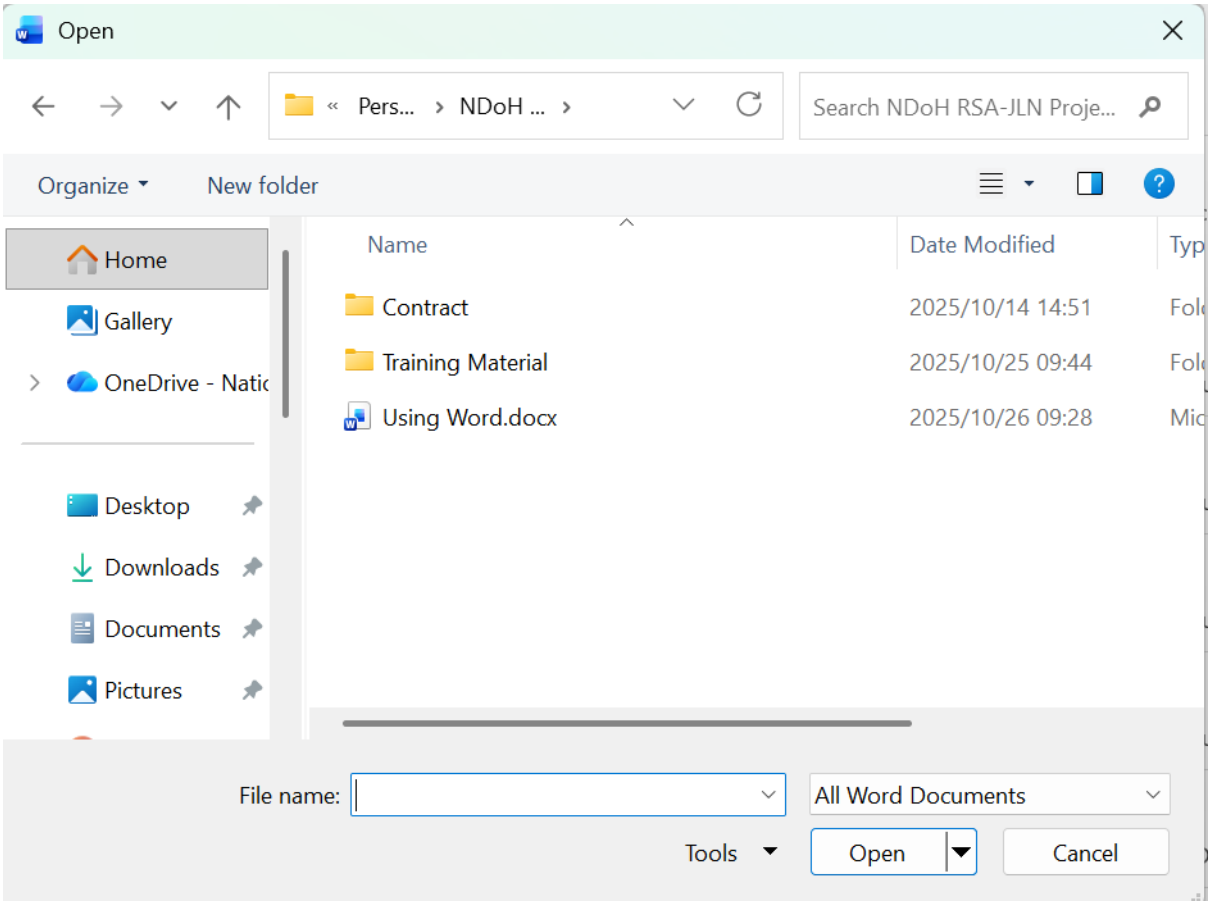
- **Storage spaces in this folder:** double click on any of the folders shown to go into that folder
- **Select more storage space:** This allows you to select from a list of storage spaces, including storage devices
- **Up one folder:** This button allows you to leave this current folder and navigate to the previous folder space.
- **Create new folder:** This button allows you to create a folder in the new folder space that you are in at the moment.
- **File name:** This is where you will type the name of the file that you are going to save. When you save a document with a name, be careful not to use characters such as ?,! and others

The most important thing to remember when saving a presentation with a name is to name the presentation so that it makes sense and describes the contents of the presentation to some degree. Never name the presentation "Presentation 1" or something like that. It will not help you to find the document again if you want to open it.

8.4 Opening Presentations

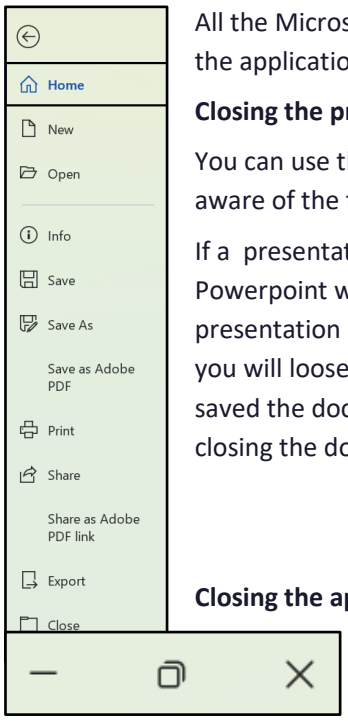


When you select the open option either from the File menu or the icon then you will be presented with a window that allows you to browse and find a document that exist in your storage space.



The Open Document interface looks very much the same as the Save As window. It allows you to browse to storage spaces and devices in the same way as that window. The big difference here is that when you select MS PowerPoint file and press the open button (it will become available when you select a file). MS PowerPoint will open a document for you. If the file is inside a folder, then double click on the folder to enter it and continue looking for a file.

8.5 Closing Presentation and MS PowerPoint

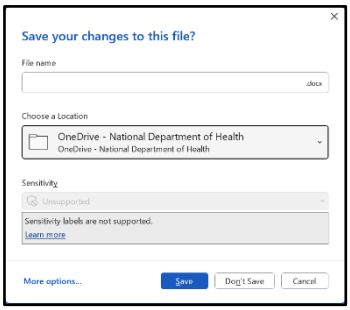


All the Microsoft Office applications have two methods to close both the document (window) and the application itself.

Closing the presentation:

You can use the file menu and then select Close to close the current presentation. You must be aware of the following:

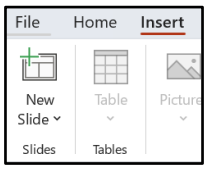
If a presentation has not been saved then closing the document will allow you to do so. MS Powerpoint will ask you if you want to to save the presentation as shown in the image , if you select No, then you will loose all the changes you had made since you last saved the document, If you select Cancel, then it will stop closing the document.

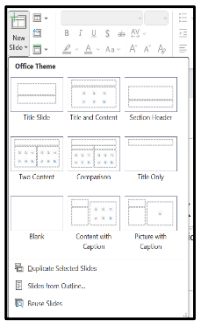


Closing the application

You can either select the File Menu or you can select the big X button in the top right-hand corner. Note: If you have any presentations open that have not been saved, then MS PowerPoint will give you the option of saving them as shown in the previous item.

8.6 Inserting slides



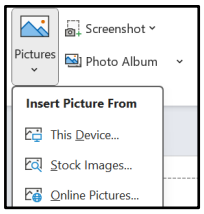


MS PowerPoint is very different from both MS Word and MS Excel because you will need more than one working area. This means that you will need more than just the starting slide in your presentation to create a good presentation. There are two methods to quickly insert a slide: The one is to select insert – New Slide and the other is to select the New Slide button on the formatting toolbar. When you insert a new slide, click on the New Slide down arrow to open a slide layout office theme pane. From here you can select which office theme you would want for your slide. There are many themes to choose from, but they are organized under different types. Selecting your slide theme will change the current slide to that theme. Text slide theme has built in text place holders where you can start typing in your text. Content themes have built in icons that allow you to insert content such as images into the slide.

8.7 Entering Text

Text has to go into a text place holder which is also referred as a text box. Depending on which slide theme you have chosen, you will have different text place holders on the screen in which to start typing. Entering text into a text place holder follows the exact same rules as entering text into a document. The keys work in the same way, Kep in mind that most of the text-based slide themes start with a set of bullets built in as you can see from the above example. When you enter text into a pre-bulleted text place holder and you press enter, you will see that the presentation creates the next text bullet. Bullets are the best way to break information in a slide, and this is why it is the default in most text place holders.

8.8 Inserting Images



There are a few methods you can use to insert images into MS PowerPoint:
From this device: This option allows you to insert image from the device
From Screenshots: This option allows you to insert screenshots taken and saved on the computer in the clipboard
From the photo album: This option allows you to insert picture in the photo album of the computer
Using Copy and Paste: This is one of the most versatile options to insert an image into a slide. Windows allows you to copy any image in any application and the copy and paste it into a slide. One great example is copying image from the internet and pasting into the slide.

8.9 Inserting graphs from MS Excel

One of the functions that you will be using MS PowerPoint for is the presentation of information gathered from data you have received from your information system like DHIS. The systems mostly provide larger in a form of large MS Excel spreadsheets. From those sheets, you would have to create charts/graphs to analyse information These charts can easily be placed in MS PowerPoint through the copy and paste system that all Windows applications have. To place the chart from a spreadsheet into a slide, open a spreadsheet, select the chart/graph, copy it, go to presentation, select the slide you want the chart in and paste it.
Note: when you do this, MS Office places the entire workbook over but only displays the chart/graph. You can edit your chart by double clicking on it. This includes the editing of the colours of the chart/graph.

Exercise

Session 1.9: Practical Exercise

> **Purpose**
> To consolidate learning by applying Word, Excel, and PowerPoint skills.

By the end of this session, you should be able to:

- Create a Word document with text and a table.
- Build an Excel table with a percentage and chart.
- Copy a chart into Word.

Microsoft Word

- Please create a folder on your desktop called last day
- Open MS word and save as “Request for more staff”
- In that document, write a letter to the CEO requesting more staff
- Include a table highlighting the available staff (at least 3 names). Headings to be as follows: Name, PERSAL No, Contact No
- Insert page numbering
- Save the letter

Microsoft Excel

- Open MS Excel and save as “Request for more staff”
- Create a table with heading as follows: Name, Salary, Percentage (percent to be calculated from the total salaries paid)
- Draw a line graph using the percentage data
- (Add title and data labels)
- Copy the graph to sheet 2
- Rename sheet 2 to “Staff”
- Then copy the graph to MS word document named “’Request for more staff”
- Give a little narration on your word document and save in the Last day folder

Microsoft PowerPoint

- Again copy the graph from MS excel and paste it in a new slide on MS PowerPoint
- Put the heading on MS PowerPoint as Request for more staff
- Save the presentation in the folder “last day” on the desktop

Day 2: Data Management

Day Overview

Primary Health Care facilities collect large amounts of information about patients, services, and health outcomes every day. However, collecting data is not enough. Data must be accurate, complete, and timely. It must be processed, analysed, and presented in a way that helps staff make better decisions. This module covers the entire journey of data — from the moment it is collected to the moment it is used to improve patient care and facility performance.

Learning Outcomes

By the end of this module, you will understand how to:

1. Collect only the data that is essential and useful.
2. Process data to ensure it is correct, complete, and consistent.
3. Analyse data using basic statistics such as averages and medians.
4. Present data in clear graphs and charts.
5. Interpret data to understand what it means for your facility.
6. Use data to make decisions and improve services.
7. Monitor and evaluate your programmes effectively.

Session at-a-Glance

Session	Focus	Method	Time
2.1	Introduction and background: why data management matters	Presentation and discussion	20 min
2.2	Data collection: principles, sources, tools, and the essential data set	Interactive lecture with examples	40 min
2.3	Data processing: collation, the 3 Cs of quality, verification, and validation	Presentation with exercises	45 min
2.4	Data analysis: statistics, measures of central tendency, and variation	Hands-on calculations	40 min
2.5	Data presentation: choosing the right graph type and design tips	Demonstration and practice	30 min

Session	Focus	Method	Time
2.6	Data interpretation: making sense of numbers using epidemiological thinking	Group discussion	25 min
2.7	Use of information: applying data to planning and decision-making	Case studies	20 min
2.8	Monitoring and evaluation: the results-based M&E model	Presentation	25 min
2.9	Exercises and activities	Individual and group work	60 min
2.10	Key messages and reflection	Plenary discussion	15 min

The Information Cycle

The information cycle is the main framework used throughout this module. It shows the complete journey of data through six stages: collection, processing, analysis, presentation, interpretation, and use. Each step is important — if one step is weak, the entire system is weak. For example, if data is collected poorly, no amount of analysis will make it useful. If data is never used, the entire cycle is wasted effort.

Section 1: Data Collection

Section Objective: Apply the guiding principles for data collection, identify appropriate data sources and tools for your facility, and recognise and reduce unnecessary data duplication.

What is Data Collection?

Data collection is the first step in the information cycle. It is the process of gathering information from patients, registers, and other sources. If data collection is done poorly, everything that follows will be unreliable.

Guiding Principles for Data Collection

You should collect data only if it meets the following four principles. First, the data must help you monitor progress toward your objectives and targets. Second, only collect data that is essential — ask yourself whether the information is a "must know" or just "nice to know." Third, the data must be analysable, meaning you should be able to turn the raw numbers into useful information. Fourth, the data must be easily available when you need it.

The Four Components of Data Collection

Effective data collection requires four key components: standardised definitions (using the National Health Data Dictionary), an essential data set (EDS) that includes only the most critical data elements, appropriate data collection tools, and appropriate data sources.

The Essential Data Set

Data Type	Description	Examples
Special programmes	Priority programmes that need special attention	HIV, TB, immunisation data
Routine service data	Basic data collected regularly	Daily headcounts, consultation data
Epidemiological surveillance	Data about notifiable diseases	Measles, COVID-19, cholera cases
Administrative data	Data used by management	Staff records, budget information
Population data	Information about your catchment area	Total population, age distribution

Common Data Sources in PHC Facilities

Source Type	Examples
Routine clinical records	Patient files, tick registers, referral forms, HTS registers

Source Type	Examples
Electronic health systems	DHIS, Tier.Net, HPRS
Administrative and operational data	HR records, stock control records
Performance monitoring data	Surveys, Ideal Clinic data

The SOURCE Criteria for Data Collection Tools

When you choose or design a data collection tool, use the SOURCE criteria to check its quality.

Letter	Meaning	Question to Ask
S	Simple	Is the tool easy to use for collecting and extracting data?
O	Overlap	Is there duplication between this tool and other tools?
U	Useful	Is this tool useful to data collectors, supervisors, and researchers?
R	Relevant	Is the tool relevant to the key functions of your unit?
C	Clear	Is the tool clearly laid out and easy to understand?
E	Effective	Does the tool achieve its intended purpose?

> **Key Message:** *"Data should be collected once, used many times — not collected many times for the same purpose."*

Section 2: Data Processing

Section Objective: Define and apply data collation, verification, validation, and quality checks. Identify common sources of error in data processing.

What is Data Processing?

Data processing is the second step in the information cycle. It includes four main activities: data collation (gathering and organising data from various sources into one place), data quality checks (ensuring data is correct, complete, and consistent), data verification (identifying incorrect data so it can be corrected), and data validation (checking whether data truly reflects the real situation).

The Three Cs of Data Quality

Standard	Meaning	Question to Ask
Correct	Accuracy	Is the data free from errors?
Complete	Wholeness	Is all required data present?
Consistent	Uniformity	Is the data the same across all sources?

Characteristics of Good Quality Data

Characteristic	Description
Current and on time	The data is up to date and available when needed at all levels.
Comprehensive	The data comes from all possible sources.
Reliable and accurate	The data can be trusted and is precise.
Usable	If data cannot be used, it should not be collected.
Comparable	Everyone uses the same definitions, so data can be compared.

How to Ensure Good Quality Data

Action	What to Do
Train staff	Provide training in data collection, quality checks, and using information.
Standardise definitions	Make definitions available at all data collection points.
Identify weaknesses	Look for possible weaknesses in your data system.
Simplify collection	Make data collection as easy as possible for staff.
Pre-test tools	Test any new data collection tools before introducing them.
Define responsibilities	Make sure everyone knows their role at every step.
Establish procedures	Put procedures in place to check data quality.
Provide feedback	Give staff feedback on the quality of the data they submit.
Explain purpose	Help staff understand why they collect data.

Data Verification Methods

Method	Description
“Eyeballing” the data	Look at the data visually to spot gaps and unusual values.
Using software functions	Use DHIS2 features to check for missing records and outliers.
Setting min/max ranges	Define acceptable ranges for each data element.
Applying validation rules	Use pre-defined rules to check data consistency.
Comparing to historical trends	Check if current data is similar to past data.
Comparing to other units	Compare your facility to other facilities or districts.
Searching for patterns	Look for relationships between different data elements.

Data Validation

Validation is the process of checking whether data is a true reflection of the real situation. There are two forms of validation rules. Absolute rules apply when one value cannot be higher than another — for example, if child attendance is 234, the total headcount cannot be 225. Statistical rules are more flexible and ensure that the ratios between data elements are not broken.

Common Sources of Error

Errors can occur at many points in the data processing chain: at collection (forms are filled out incorrectly or incompletely), at entry (data is typed incorrectly into the computer), at calculation (totals or percentages are calculated wrong), at reporting (the wrong numbers are submitted to higher levels), and at interpretation (numbers are misunderstood or taken out of context).

Section 3: Data Analysis

Section Objective: Apply basic statistical concepts to facility data. Calculate and interpret measures of central tendency. Identify common misuses of statistics.

What is Data Analysis?

Data analysis is the third step in the information cycle. It turns raw data into useful information. At the facility level, most analysis involves comparing actual activities against your plans and targets.

The Four Cornerstone Questions for Facility Assessment

When you analyse any programme at your facility, ask these four questions. Coverage: did everyone who should have received services actually receive them? Quality: how good is the service you provided? Continuity: did you follow up with clients who needed it? Risk: did you identify all clients with potential problems and intervene to minimise those problems?

Introduction to Statistics

Statistics is the science of collecting, classifying, analysing, interpreting, and presenting numerical facts or data. Descriptive statistics are used to describe the nature of your data — they answer questions like “How many?”, “How often?”, and “What is the average?” Inferential statistics are used when you inspect samples and make generalisations or predictions about a larger population.

Key Statistical Terminology

Term	Definition
Error	The difference between your answer and the true answer.
Measurement	Making observations and recording them in numerical form.
Variables	The elements that we measure (e.g. birth weight varies between babies).
Frequency	The number of times you can count a result or value.
Correlation	An association or relationship between variables.
Sample	Data selected when measuring entire populations is impractical.

Measures of Central Tendency

Mean (Average): Add up all the values and divide by the total number of observations. The mean is the most useful measure, but it should not be used when the scores are skewed or have extreme values. Example: for the data set 2, 4, 6, 8, 10, 12, 14, the mean is (2+4+6+8+10+12+14) ÷ 7 = 56 ÷ 7 = 8.

Median: The middle value when data is ordered from smallest to largest. If there is an even number of values, the median is the average of the two middle numbers. For the data set 2, 4, 6, 8, 10, 12, 14, the median is 8 (the middle value).

Measures of Variation

The range is the difference between the largest and smallest value. The variance is the difference between the mean and the highest value, and the mean and the lowest value in the data set. The range is based on only two extreme values, so it should be used together with other measures of variability.

Common Misuses of Statistics

- Using the mean when the median would be more appropriate (for skewed data).
- Drawing conclusions from very small samples.
- Confusing correlation with causation (just because two things are related does not mean one causes the other).
- Presenting data without context or comparison.
- Ignoring outliers that may indicate data quality problems.

Section 4: Data Presentation

Section Objective: Choose the appropriate graph type for different types of data. Create and interpret line graphs, bar graphs, and pie charts.

Choosing the Right Format

Format	Best Used For
Tables	Showing exact numbers. Keep tables small and clear.
Line graphs	Showing trends over time (months, years).
Bar graphs	Comparing different categories.
Pie charts	Showing proportions as parts of a whole.
Cumulative graphs	Showing progress that builds up over time.

Types of Graphs

Line Graph: Best for showing trends over time. For example, you might use a line graph to show immunisation coverage from January to December. The line makes it easy to see whether coverage is going up, going down, or staying the same.

Bar Graph: Best for comparing different categories. For example, you might use a bar graph to compare TB cure rates across five different facilities. The length of each bar makes comparisons quick and easy.

Pie Chart: Best for showing proportions of a whole. Each part of the population is shown as a slice of the pie. For example, you might use a pie chart to show the target population as a proportion of the total catchment population.

Tips for Designing Good Graphs

Tip	What to Do
Keep it clear and simple	Usually use one indicator on one graph. Stick to one group of people, disease, or service.
Include a heading	Clearly state what the graph shows.
Show the source	Indicate where the information came from.
Show the time period	Indicate what period the data represents.
Label the axes	Clearly state what is being shown on each axis.
Include a legend	Explain what each line or bar represents.
Show a target line	Indicate where you are aiming (if applicable).
Consider colours	Make sure the graph is readable even if printed in black and white.

Section 5: Data Interpretation

Section Objective: Interpret data to make sense of facility performance. Apply epidemiological thinking (who, what, when, where, why, how).

Interpretation is the fifth step in the information cycle. It is the process of making sense of the data and monitoring progress. Data alone is just numbers; interpretation turns those numbers into meaning. There are two main ways to interpret data: compare data (against norms, targets, other facilities, or other areas) and look for trends (patterns over time showing whether performance is improving, stable, or worsening).

Epidemiological Thinking

Question	Purpose
Who?	Identify the population affected.
What?	Identify the health condition or event.
When?	Identify the time period.
Where?	Identify the location.
Why?	Identify possible causes.
How?	Identify the mechanism of spread.

Preparing for Interpretation

Before you can interpret data effectively, you need to check the 3 Cs (ensure your data is correct, complete, and consistent), have enough data (a minimum of six months of good quality data), have local knowledge (understanding of your population and services), discuss with others (different perspectives catch things you might miss), and turn data into information (once data has been analysed and interpreted, it becomes user-friendly information for management).

Section 6: Use of Information

Section Objective: Apply information to facility planning and decision-making. Use information effectively in the planning cycle.

The use of information is the sixth and final step in the information cycle. It is the most important step because it turns all the previous work into action. If information is not used, the entire cycle was a waste of time.

Common Uses of Information

Use	Description
Compile a facility profile	Describe your facility and the services you provide.
Assess health needs	Prioritise the health needs of your catchment population.
Plan services	Plan and manage services and resources effectively.
Monitor and evaluate	Track progress and impact of health programmes.
Mobilise communities	Take action at the community and household levels.

Requirements for Effective Information Use

Requirement	Description
Relevant	The information must apply to the situation at hand.
Good quality	The information must be accurate and reliable.
User-friendly	The information must be presented clearly.
Available where needed	The information must reach the right people.
Available when needed	The information must be timely.

The Planning Cycle

The information cycle supports each stage of the planning cycle, which has four stages: situational analysis, priority setting and planning, implementation, and monitoring and evaluation. Without good information, you cannot plan effectively. Without monitoring, you cannot know if your plan is working. Without evaluation, you cannot know what to change for next time.

Section 7: Monitoring and Evaluation

Section Objective: Distinguish between monitoring and evaluation. Apply the results-based M&E model. Identify different types of indicators.

Monitoring vs Evaluation

Aspect	Monitoring	Evaluation
Definition	Routine, ongoing assessment of activities	Time-bound, periodic assessment
Timing	Continuous throughout the programme	At specific points (baseline and end)
Purpose	Track changes in performance over time	Answer specific questions to guide decisions
Focus	Implementation (process evaluation)	Impact and outcomes
Comparison group	Not required	Required (control or comparison group)

The Results-Based M&E Model

Level	Definition	Question It Answers	Indicator Type
Input	Resources needed to carry out activities	What do we use?	Services indicators
Process	Activities in which inputs are used	What do we do?	Accessibility and utilisation
Output	Products and services resulting from activities	What do we deliver?	Coverage indicators
Outcome	Immediate change resulting from outputs	What do we wish to achieve?	Effectiveness and efficiency
Impact	Extent to which long-term goal is achieved	What do we aim to change?	Mortality, life expectancy

Section 8: Exercises and Activities

Exercise 1: Identifying Data Overlaps

Instructions

Study the two registers below and answer the questions that follow.

Register 1: PHC Headcount Register

Patient Name	Date	Reason for Visit
John Maseko	01/03/2026	Cough
Nomsa Dlamini	01/03/2026	Fever
Thabo Nkosi	02/03/2026	Headache
Lerato Mokoena	02/03/2026	Diarrhoea
Sipho Khumalo	03/03/2026	Wound dressing

Register 2: TB Screening Register

Patient Name	Date	TB Symptoms
John Maseko	01/03/2026	Cough >2 weeks
Nomsa Dlamini	01/03/2026	Night sweats
Maria Dube	02/03/2026	Weight loss
Peter Molefe	03/03/2026	Cough
Zanele Sithole	03/03/2026	Fever

1. Which patients appear in both registers?

2. Which patients appear in only one register?

3. What information is duplicated between the two registers?

4. What are the consequences of collecting the same data twice?

5. How can the facility reduce duplication in data collection?

Exercise 2: Data Processing Activities

Instructions

For each activity below, tick (✓) whether it is Collation, Verification, Validation, or Quality Check.

Activity	Collation	Verification	Validation	Quality Check
1. Admin clerk compiles monthly totals from daily tally sheets into a summary report				
2. Data capturer notices total headcount (225) is less than child attendance (234) and flags this				
3. Supervisor checks that all patient files have a completed HIV testing section				
4. Nurse confirms recorded blood pressure matches the original observation				
5. System rejects entry because child's age (25 years) exceeds the maximum allowed				
6. Data capturer gathers HIV testing data from three different registers into one spreadsheet				
7. Manager reviews monthly data for missing entries and incomplete fields				
8. System compares ANC attendance with PMTCT numbers and flags a discrepancy				

Exercise 3: Calculating Mean and Median

Instructions

Calculate the mean (average) and median for the data sets below. Show your working.

Data Set A: Monthly immunisations for 7 facilities: 45, 52, 48, 50, 47, 55, 49

Mean (average) — show your working:

Median (middle value) — show your working:

Data Set B: Monthly headcounts for 6 months: 120, 135, 128, 142, 130, 125

Mean (average) — show your working:

Median (middle value) — show your working:

Exercise 4: Choosing the Right Graph

Instructions

For each scenario below, tick (✓) the type of graph that would be most appropriate.

Scenario	Line Graph	Bar Graph	Pie Chart
Showing immunisation coverage from January to December			
Comparing TB cure rates across 5 different facilities			
Showing the proportion of patients by disease category (HIV, TB, Hypertension, Diabetes)			
Tracking the number of patients on ART over 24 months			

Exercise 5: Identifying Indicator Types

Instructions

For each indicator below, tick (✓) the correct category.

Indicator	Input	Process	Output	Outcome	Impact
1. Number of nurses trained in NIMART					
2. % of HIV+ patients with suppressed viral load					
3. Life expectancy of the population					
4. Number of patients receiving ART					
5. Number of condoms distributed					
6. Number of facility outreach sessions conducted					
7. % reduction in HIV-related mortality					
8. Budget allocated to the HIV programme					
9. Number of patients counselled on adherence					
10. % of pregnant women attending ANC before 20 weeks					

Exercise 6: Monitoring or Evaluation?

Instructions

For each scenario below, tick (✓) whether it describes Monitoring or Evaluation.

Scenario	Monitoring	Evaluation
1. A nurse reviews monthly immunisation data to track progress toward the annual target		
2. A study compares vaccination rates in a community with a new outreach programme versus one without		
3. A facility manager checks weekly headcount data to adjust staffing levels		
4. A research team measures the impact of a 3-year nutrition programme on child malnutrition rates		
5. A data capturer enters daily HIV testing numbers into Tier.Net		
6. A district manager compares baseline and endline data to determine if a TB programme achieved its objectives		

Section 9: Key Messages and Reflection

Key Messages from Day 2

- Data quality underpins all decisions. If your data is not accurate, complete, and consistent, any decision based on that data may be wrong.
- Everyone plays a role in the information cycle. Every health worker, from the nurse at the bedside to the data capturer at the computer, contributes to data management.
- Data must be used, not just collected. Collecting data without using it wastes time and resources.
- Collect once, use many times. Avoid duplicating data collection across different registers and programmes.

Day 3: PHC Data Sources, interpretation and data uses

Learning Outcomes

By the end of this module, you will understand how to:

1. Explain the purpose of key health information systems
2. Access and navigate each system
3. Retrieve and evaluate data
4. Interpret data trends and comparisons
5. Create effective data visualizations
6. Communicate insights and plan actions

Session at-a-Glance

Segment	Focus of Session and Learning Outcomes	Method	Outputs	Time (minutes)
Welcome & Orientation	Set expectations; situate session within 5-day programme; align on data use goals	Mini-presentation + discussion	Understanding session goals and alignment with PHC performance improvement	15
System Overview	Introduce ICMS, DHIS, Tier.Net, ETR.Net, DHB: what data they collect and how they connect	Interactive lecture	Participants can describe each system's purpose and data types	20
System Navigation & Demonstration	Walkthrough how to access key indicators, export data, check quality in each system	Facilitator-led demo	Familiarity with login flows, key screens, indicator reports and export steps	30
Hands-On Data Practice	Guided extraction and review of real/simulated indicators from each system	Individual work + coaching	Completed indicator extraction worksheet; ID'd completeness and performance issues	40
Visualisation & Trend Analysis	Build line/bar charts in Excel; interpret trends and coverage gaps	Pair activity + demo	Excel charts with labels; visual narratives and observations on coverage or outcomes	25
Communicating Insights	Write simple summaries; draft SMART actions; practice data storytelling	Group exercise	Insight paragraph; one-page briefing draft; SMART target written	25
Wrap-up & Self-Assessment	Reinforce learning; reflect on application in facility/district setting	Plenary discussion + checklist	Completed self-assessment; key takeaways recorded in reflection notes	15

Introduction to Key Health Information Systems

In South Africa, routine health data is collected and managed through several systems. As a PHC manager, it's important to know what each system does and what data it provides. Below is an overview of the four main systems we will be working with:

1. Ideal Clinic Monitoring System (ICMS)

What it is: The Ideal Clinic Monitoring System (ICMS) is a national system used to monitor, assess, and support improvement in Primary Health Care facility performance. Unlike DHIS (which counts services delivered) or Tier.Net (which tracks individual patient outcomes), ICMS focuses on whether the facility itself is organised and equipped to deliver quality care.

Data type: Systems-level assessment data. ICMS does not collect patient-level data or monthly service statistics. Instead, it evaluates facility readiness across multiple domains such as infrastructure, staffing, medicine availability, patient flow, governance, and information management.

Purpose: *ICMS answers the question:* ***Is my clinic ready and organised to deliver quality PHC services?*** If facility systems are weak, then even capable staff will struggle to deliver good outcomes. ICMS helps managers identify where the system is not supporting staff to do their work well, and it provides evidence for prioritising improvement efforts.

2. District Health Information System (DHIS)

What it is

The District Health Information System (DHIS) is the national aggregate data system for health information. It is used to capture routine service delivery data at health facilities and compile it up through sub-district, district, provincial, and national levels. Every month (or reporting period), facilities fill in data on services (immunizations, antenatal visits, HIV tests, etc.), which is entered into DHIS. This system then allows managers to view reports and indicators that summarize these data for their area.

Data type

Aggregated facility data (not patient-level). Examples of data elements in DHIS include: number of antenatal first visits, number of children immunized, number of TB cases recorded, etc., usually aggregated by month and by facility. Indicators (like percentages or rates) are often calculated from these data elements within DHIS.

Purpose

DHIS provides an overall picture of service delivery. It's used for reporting and monitoring coverage, utilization, and performance of health programs. For example, the immunization coverage (%) for a

district is calculated in DHIS by combining facility data. The system is crucial for monitoring trends over time and across geographic areas. It also feeds into higher-level analytics and publications (like the DHB). As a PHC manager, you might use DHIS to track your clinic's performance against targets or to identify gaps (e.g., low immunization rates or high default rates).

3. Tier.Net (HIV Patient Management System)

What it is

Tier.Net is an electronic patient management system originally developed for the HIV/AIDS program. It operates at facility level as an offline electronic register for antiretroviral therapy (ART) patients. Since 2010, Tier.Net has been the primary monitoring platform for the national ART programme. It has modules to record patient information from the time of testing and enrollment (pre-ART) through ART initiation and follow-up. In some provinces, Tier.Net has also been expanded to include TB data modules, integrating HIV and TB information at facility level.

Data type (**Patient-level data (HIV)**

Tier.Net stores individual patient records for those in HIV care (and TB, if integrated). It records data such as patient demographics, ART start dates, clinic visits, lab results (CD4 counts, viral loads), and outcomes (e.g., transferred out, lost to follow-up, etc.). From these records, Tier.Net can produce aggregated reports and indicators (for example: number of patients currently on ART, number of defaulters, viral suppression rate, etc.).

Purpose

The system is used to track patient outcomes and to generate program statistics for HIV at the facility and sub-district level. Tier.Net is integrated with DHIS for reporting certain program indicators, meaning that summary data from Tier.Net (like number of patients on ART, or number of new ART initiations) can be uploaded into DHIS for district/national reporting. For PHC managers, Tier.Net is useful to identify patients who need follow-up (like those who missed visits) and to monitor the performance of the HIV program (retention rates, etc.). In this training, we will focus on how to obtain key reports from Tier.Net and use them in analysis.

4. ETR.Net (Electronic TB Register)

What it is

ETR.Net stands for Electronic Tuberculosis Register. It is a system that was introduced in mid-2000s to improve TB data collection and utilization across South Africa. Historically, TB data were captured in paper registers at facilities, and ETR.Net was used at sub-district or district level to compile those data electronically. ETR.Net specifically handles drug-sensitive TB cases (there is a separate system for drug-resistant TB in some areas).

Data type (**Patient and aggregate data)**

ETR.Net captures patient-level TB case information (e.g., patient details, diagnosis date, treatment regimen, outcomes like treatment completed or defaulted). Facilities would send their TB case data (or entry forms) to a TB coordinator who enters it into ETR.Net at the sub-district/district level. The system then generates cohort reports (like treatment outcome statistics: cure rate, treatment success rate, default rate, etc.) and other indicators such as case detection rates. It is not as real-time at facility level as Tier.Net, but rather a compiling tool for TB data.

Purpose

ETR.Net is used for programme monitoring and evaluation of TB control efforts. It allows health managers to track how well the TB program is doing for example, what percentage of patients are cured, died, or lost to follow-up in a given quarter's cohort. For a PHC manager, understanding ETR.Net reports means you can identify issues like low cure rates or high default rates in your facility or sub-district, which might need intervention.

Note that efforts have been made to integrate TB data into Tier.Net (for a "one patient, one record" system for HIV/TB), but ETR.Net remains in use in many areas for reporting TB outcomes. We will learn how to interpret the key outputs of ETR.Net.

5. District Health Barometer (DHB)

What it is

The District Health Barometer (DHB) is a public-facing online dashboard and annual publication that provides an overview of key health indicators by district (and for many indicators, by sub-district). It compiles data primarily from routine sources (WebDHIS) and some other official data sources to allow benchmarking and trend analysis across districts. The DHB website offers interactive charts and maps for a variety of health programs (maternal health, child health, infectious diseases, non-communicable diseases, health system inputs, etc.).

Data type: Aggregated indicators (district/sub-district level).

Examples of indicators available in the DHB include: ANC first visit before 20 weeks (%), Measles immunization coverage (%), TB cure rate (%), HIV viral load suppression (%), facility under-5 mortality rate, doctors per 100,000 population, and many more. These are often presented as percentages, rates, or ratios, drawing from DHIS data and surveys. The data are usually updated annually (the interactive dashboard is updated when new annual data become available).

Purpose

The DHB's purpose is to enable comparison and analysis. For instance, you can compare your district's performance to provincial and national averages or to peer districts. It's great for identifying outliers (e.g., if your district is doing much better or worse than others on an indicator) and for observing trends over time at a higher level. As a PHC manager, while you manage at facility level, the DHB helps you understand the broader context of your work and where to prioritize. For

example, if the DHB shows your district has the lowest immunization coverage in the province, that highlights a strategic area to focus on. We will spend time using the DHB dashboard to interpret data and practice setting targets.

Ideal Clinic Monitoring System (ICMS)

> **Key Point:** ICMS checks systems, not individuals. If patients wait too long, ICMS helps you look at flow, staffing, and organisation — not blame individuals for working slowly. This is what makes ICMS such a valuable management tool.

What Does ICMS Measure?

ICMS assesses facility performance across a broad range of components. The table below summarises the key areas and what each one covers.

ICMS Component	What It Assesses
Infrastructure and Equipment	Availability of functional consulting rooms; essential equipment present and in working order.
Human Resources and Organisation	Staffing levels compared to norms; staff allocation and role clarity across service areas.
Clinical Service Delivery	Organisation of patient flow; integration of services (e.g. HIV, TB, NCDs) within the facility.
Medicines, Supplies and Information	Medicine availability and stock management; use of standard operating procedures and clinical guidelines.
Patient Experience and Governance	Waiting times; complaint management systems; regular management meetings and review processes.

Important: ICMS focuses on systems and readiness, not monthly service outputs. It explains ***why*** performance looks the way it does in routine data systems like DHIS.

How ICMS Relates to Other Health Information Systems

Each of the health information systems you are learning about in this module answers a different question. Understanding how they complement each other is essential for effective facility management.

System	Question It Answers	Data Type
ICMS	Is my clinic ready and organised to deliver quality care?	Systems-level assessment

System	Question It Answers	Data Type
DHIS	What services were delivered and how many?	Aggregated facility statistics
Tier.Net	What happened to individual patients in the HIV/TB programme?	Patient-level data
DHB	How does my district compare to others over time?	Aggregated benchmarking indicators

These systems are complementary, not duplicative. For example, if DHIS shows poor immunisation coverage at your facility, ICMS might help explain why — perhaps there are staff shortages, vaccine storage problems, or poor patient flow. No single system is sufficient on its own; as a PHC manager, you need to use them together to get the full picture.

ICMS as a PHC Management Tool

> **ICMS is not an audit tool. It is a management and improvement tool.**

As a PHC manager, your role is not to manage the ICMS tool itself, but to use the information it produces. When ICMS results are available, they should be discussed with your facility team. The key management questions to ask are: What are the main gaps? Which gaps are within our control to address? Which ones require district-level support?

PHC managers use ICMS findings for four key purposes:

The Identify – Inform – Support – Track Framework

Step	What It Means	Example
Identify	Pinpoint the systems gaps revealed by ICMS findings.	ICMS shows patient flow processes are not clearly defined.
Inform	Use findings to make evidence-based management decisions.	Raise the patient flow issue at the next management meeting with data.
Support	Determine what support is needed and from whom.	Request district assistance for patient flow redesign training.
Track	Monitor whether actions taken are producing improvement.	Review patient waiting times monthly; repeat ICMS assessment in 6 months.

ICMS findings should feed into routine planning, supervision discussions, and Quality Improvement projects. They should trigger management action, not sit in a report.

Common Misunderstandings About ICMS

Misunderstanding	Reality
ICMS is just another audit.	ICMS is a management and improvement tool. If treated as a tick-box exercise, its value is lost.
ICMS is only for compliance reporting.	ICMS findings are most valuable when used for internal management decisions and facility improvement.
ICMS is separate from daily management.	ICMS should inform everyday decisions about staffing, organisation, and priorities. It is part of routine management, not a standalone exercise.

Reading an ICMS Summary: A Simulated Example

The table below presents a simulated ICMS dashboard extract. Study the findings carefully — you will use them in the group exercise that follows.

ICMS Component	Status
Patient Flow and Waiting Time Management	✗ Not Met
Medicines and Supplies Management	✗ Not Met
Human Resources Organisation	⚠ Partially Met
Use of Information for Decision-Making	⚠ Partially Met
Infrastructure and Equipment	☑ Met
Governance and Management Processes	☑ Met

Summary of Key Findings

Areas requiring immediate attention:

Patient flow processes are not clearly defined or implemented. Waiting times are not routinely monitored or reviewed. Medicine stock management processes are inconsistently applied.

Areas requiring strengthening:

Staff roles and allocation are not optimally aligned to service demands. Routine data is available but not consistently used in decision-making forums.

Areas performing adequately:

Infrastructure meets minimum functional requirements. Regular management meetings are conducted.

From ICMS Findings to Quality Improvement

ICMS tells us what is wrong at a system level, but it does not tell us why the problem exists or how to fix it. This is where Quality Improvement (QI) tools come in.

For example, ICMS may show that patient flow is not working well, but it does not explain where the bottleneck is or what change would work best. QI tools such as process mapping, root cause analysis (fishbone diagrams and 5 Whys), and the PDSA cycle help us understand the causes and test solutions.

> **Remember:** ICMS helps us see the problem. QI helps us solve it. In Day 4 of this programme, you will learn the QI tools that turn ICMS findings into practical action. On Day 5, you will apply the full cycle in your practicum mini-project.

Group Exercise: Using ICMS Findings for Decision-Making

> *This exercise simulates how ICMS should be used in routine management meetings.*

Working in small groups, use the simulated ICMS summary above to complete the following four steps. Compile your answers in a PowerPoint presentation ready to share with the whole class.

Step 1: Review ICMS Findings

Examine the simulated ICMS summary. Identify two to three weak areas that require attention. Write them below.

Weak areas identified:

Step 2: Ask Management Questions

For each weak area you identified, discuss the following questions with your group and record your answers.

What system is failing? Who is affected? Is this within facility control or does it require district support?

Step 3: Decide on Action

Based on your discussion, determine what support is needed, who should provide it, and what is realistic to achieve in the short term.

What support is needed? Who should provide it? What is realistic in the short term?

Step 4: Track Improvement

Decide how you will know whether your actions are working. What evidence will show improvement, and when will progress be reviewed?

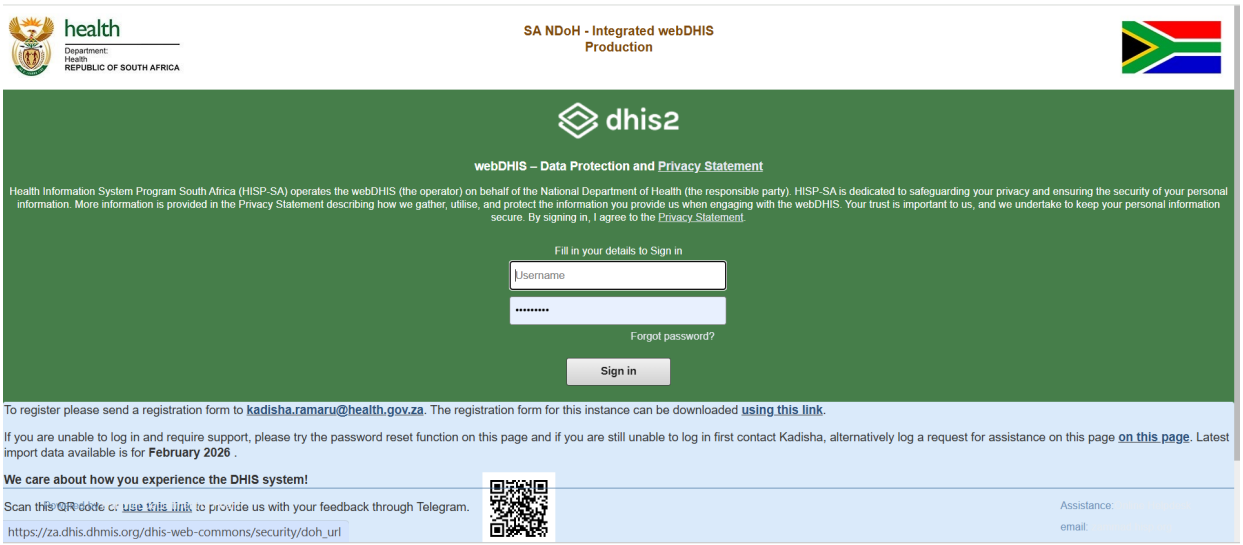
What evidence will show improvement? When will progress be reviewed?

Using DHIS for Routine Data Analysis

In this section, we will go step-by-step through using the District Health Information System (DHIS) to find and extract routine data. We'll cover logging in, navigating the system, finding specific indicators, exporting data, and checking data quality/completeness. Follow along on your computer if possible, and use the provided login credentials for the DHIS training database.

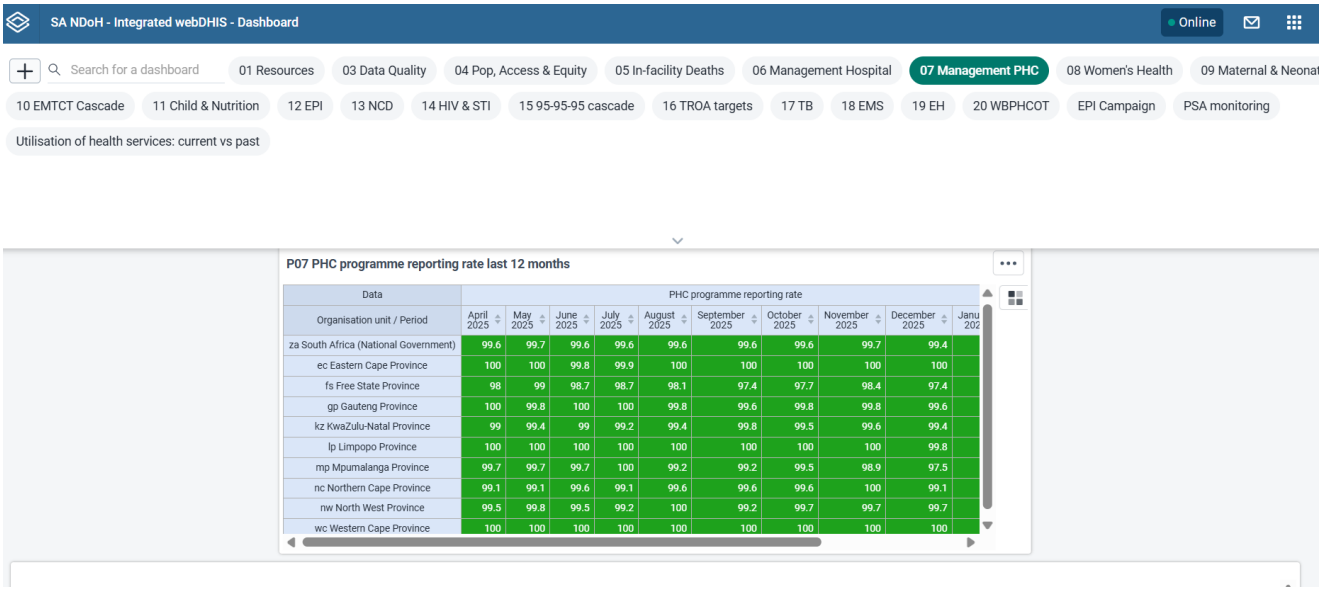
Logging In to DHIS

1. **Open the DHIS Website:** Launch your web browser and go to the DHIS login page. (If using the national webDHIS, the URL will be provided by the facilitator. You should see a login screen with the DHIS logo and fields for username and password.



DHIS Login Page

2. **Enter Credentials:** Input the username and password given to you for the training DHIS instance. Double-check spelling and case (usually usernames aren't case-sensitive, but passwords are). Click the "Log in" button. If successful, you will be taken to the DHIS home page. If you cannot log in, raise your hand for assistance.



DHIS Home Dashboard after login

3. **Home Dashboard Overview:** Once logged in, you'll see the DHIS home or dashboard screen. This typically includes a menu of apps (modules) such as Dashboard, Data Entry, Reports, Analytics (Pivot Table, Data Visualizer, Maps), etc. Familiarize yourself with the interface. The main navigation might be a grid of icons or a menu on the left side (depending on DHIS version). We will primarily use the Reports and Analytics apps for our tasks.

Finding Specific Indicators in DHIS

There are multiple ways to retrieve data in DHIS. We will practice two approaches: using a pre-built report (for data completeness) and using the analytics tools to get indicator data.

A. Checking Data Completeness (Reporting Rate):

Before analyzing performance, it's important to ensure the data is complete. DHIS can show you the **reporting rate** for facility reports (i.e., what percentage of expected reports have been submitted).

- Navigate to the **Reports** app from the DHIS menu (click the "Reports" icon).
- In the Reports app, find the option for **"Reporting Rate Summary."** This report allows you to check how many facilities submitted their data for a given dataset and period.
- **Select parameters:** Choose the data set (for example, "PHC facility monthly report" or an immunization dataset – the facilitator will specify which), the time period (e.g., last month or last quarter), and the organisation unit (your district or sub-district).
- Click **"Generate" or "Get Report."** The system will display a table listing each facility (or sub-district) and the number of reports expected vs. received, often expressed as a percentage (the reporting rate). Review this output to identify if any facility didn't report (100% means all expected reports are in; 80% would mean some are missing).

Note: *If you find incomplete data (less than 100% reporting), remember that your performance indicators might be artificially low (missing data). You may need to follow up with those facilities to submit their reports, or at least interpret their indicators with caution. We call this a quick data quality check.*

B. Retrieving an Indicator (Analytics):

Next, let's get an actual health indicator from DHIS, for example Immunization Coverage under 1 year (%) or ANC 1st visit before 20 weeks (%). We can use the Pivot Table or Data Visualizer app for this. Here, we'll use the Pivot Table (steps are similar in Data Visualizer):

1. In the DHIS menu, click on **"Pivot Table"** (an analytics tool). A blank pivot interface will open, where you can select data dimensions.
2. **Select an Indicator:** On the left panel, you'll see options to choose Data, Period, and Organisation Unit. Under **"Data,"** switch from Data Elements to **Indicators** (if not already). Use the search or expand the categories to find the indicator you want. For example, navigate to **Maternal Health** or **Child Health** category to find "ANC <20 weeks" or "Immunization <1 year coverage." Click on the indicator name to select it.
3. **Select Period:** Click the **Period** dimension. For a quick view, select the latest year or the last 1-2 years (e.g., 2024-2025 if data is by financial year, or specific quarters/months). You can select multiple periods if you want to see trends. For instance, choose the last 5 years to see a trend by year.
4. **Select Organisation Unit:** Click **Org Unit** and choose your relevant area. If you want to see data for your facility, expand the hierarchy to find your facility name. If you want district-level aggregated data, select your district. (For this exercise, you might select the District to get the overall value, since coverage indicators are usually aggregated at district level.)
5. **Generate the Pivot Table:** Once the Data, Period, and Org Unit are selected, click **"Update"** or **"Generate."** DHIS will fetch the data and display it in a table format. For example, it might show a table with Year on one axis and the Indicator value on the other. Check the numbers that appear – this is your indicator's

value. If you selected multiple years, you will see one column per year.
(Screenshot: DHIS Pivot Table showing ANC <20 weeks % for 2018–2022 for District X)

6. **Interpret the number:** Suppose the pivot table shows ANC <20 weeks coverage for your district was **60% in 2021/22**. Think about what that means: 60% of pregnant women had their first antenatal visit before 20 weeks. Is that good or bad? You might recall a target (say national target is 80%). This suggests a gap. We will delve more into interpretation later, but note the values. If you pulled multiple periods, see the trend (did it increase from, say, 50% to 60% over five years?).
7. **Exporting Data:** DHIS pivot tables can be downloaded for further analysis. Click the **"Download"** or export button (often looks like an arrow or three dots menu on the pivot table app). Choose **Excel** or **CSV** format. Save the file to your computer. This exported data can now be opened in Excel for making custom charts or combined with other data

Tip: If you have trouble finding an indicator in the analytics app, use the search bar and type a keyword (e.g., "ANC" or "Immunization"). Also, ensure you selected the correct organisation unit level (some indicators might only aggregate at district or higher). If no data appears, it could be that there is truly no data, or you may need to click "Include children" if you selected a higher level org unit and want all sub-units aggregated.

Activity: Using DHIS for Data Retrieval and Quality Check

Hands-On Task: Work through the following using DHIS

A. Find an Indicator Value: Using the Pivot Table or Data Visualizer, find your *facility or district's* latest value and a recent trend for **one Maternal/Child Health indicator** and **one Infectious Disease indicator** of your choice. For example, you might choose **"Antenatal 1st visit before 20 weeks (%)"** and **"Immunization coverage under 1 year (%)"**.

Note down the most recent value and how it has changed over the past few years (is it improving or declining?). Use the space below to write these down:
Indicator 1 (MCH): ___ – Latest value = _; Trend (last 3-5 years): _____
Indicator 2 (Infectious/NCD): ___ – Latest value = _; Trend: _____

B. Data Completeness Check: Run a reporting rate summary for your district for last month's data (or a recent period). What was the overall reporting completeness (%)? Did any facilities not report? List any data quality flags:
Reporting completeness for ___ (dataset & period): __%
Facilities missing reports (if any): _____
Comments on data quality (e.g., any obvious data errors or outliers observed in the indicator trends?):
_____

Take a few minutes to interpret the numbers you found. **List one observation** from the data that you find interesting or concerning. For example, *"Our immunization coverage increased from 72% to 85% over five years, which is a great improvement, but it's still below the 90% target."* Write your observation here:
Observation: _____.

(We will discuss our findings in the group.)

Using Tier.Net for HIV Programme Data

Next, we turn to **Tier.Net**, the HIV electronic register system. Many PHC facilities use Tier.Net to capture and monitor patient data for those on antiretroviral therapy (ART). In this session, we focus on how managers can get useful information out of Tier.Net, even if you are not the data capturer yourself. Typically, as a manager, you might receive regular Tier.Net reports (monthly or quarterly) from your data capturer or information officer. Here, we'll explore the interface and key reports.

Accessing Tier.Net

1. **Launching Tier.Net:** Tier.Net is a standalone application (not a web application) usually installed on a computer at the facility. If it's available on your training computer, double-click the **Tier.Net icon** to open it. (If it's not installed for training, the facilitator will provide a sample printout or screenshot to work with.) *(Screenshot: Tier.Net login or main screen)*
2. **Login/Security:** Each user should have their own credentials. Once logged in, you might need to select the **facility name** or database if multiple facilities' data are on the system.
3. **Main Menu:** The Tier.Net interface typically has menus or tabs for **Patient Management, Reports, Administration,** etc. We will focus on the **Reports** section, since that's where aggregate data can be viewed. Ensure the system is set to the correct facility/district that you want to see data for (some Tier.Net setups aggregate data upwards, others are facility-specific).

Finding Key Indicators in Tier.Net Reports

Tier.Net can generate several useful reports for monitoring the HIV program. As a PHC manager, the most relevant are usually the Cohort reports and Cross-sectional reports:

- Cohort Reports: These look at groups of patients who started ART in a certain time frame (e.g., a quarterly cohort) and track their outcomes (e.g., how many are alive on treatment, died, lost, etc. after 12 months). This gives retention and outcome indicators like 12-month retention rate, etc.
- Cross-Sectional Reports: These provide a snapshot at a point in time – e.g., how many patients are currently on ART at the facility (active patients), how many are due for visits, etc.

Let's retrieve a couple of data points as an exercise:

1. Monthly Summary Report: Navigate to the Reports menu in Tier.Net. Look for a report labeled "Clinic Summary" or "Monthly Statistics" (names can vary by version). Run this report for the *most recent month or quarter* available. The system might ask for a date range or automatically use the latest data. Once generated, it will show various figures like: *Number of patients currently on ART, Number of new ART initiations this month, Number of patients lost to follow-up (LTFU), etc.*

Facility Management Report

This report highlights to the facility manager issues derived from the reports listed in the first column that require attention

Selected level: mp Belfast Gateway Clinic
Date generated: 2026/03/26
Period: February 2026

Signed off by: _____
Designation: _____

Report	Data element	Value	Flag
HTS report	Number of HTS tests this month compared to the previous year's average. Green tick if above previous facility average.	Below previous facility average	✗
Monthly report / waiting list for ART	Patients on waiting for ART list for more than 2 months. Green tick if =< 1.	2	✗
Monthly report	This months ART enrolment compared to the previous year's average. Green tick if above previous facility average.	Above previous facility value	✓
Monthly report	This month's ART remaining in care compared to previous month's. Green tick if RIC is increasing.	RIC is decreasing	✗
HIV unconfirmed lost to follow-up list	Percentage HIV uLTF (of RIC). Green tick if =< 3%.	0,29%	✓
Viral load due list	Percentage of clients on ART greater than 7 months but less than 9 months and no first VL available. Green tick if =< 1%.	0,00%	✓
Viral load cascade list	Number of patients with VL >1000 and no follow up VL after 5 months. Green tick if =< 1.	3	✗
TB identification report	Percentage of presumptive TB cases with bacteriological test done (>=5 years) / all presumptive TB cases (>=5 years). Green tick if > 98%.	100,00%	✓
DS-TB discharge sputa required list	Percentage of PTB bacteriologically positive overdue for discharge sputa / All PTB bacteriologically positive. Green tick if < 5%.	75,00%	✗
Sputum conversion report	Number of PTB clients with a positive 2 month smear result that have not had a smear done at 3 months (2 month lag). Green tick if 0.	3	✗
TB unconfirmed lost to follow-up list	Percentage TB uLTF (of RIC). Green tick if =< 5%.	0,00%	✓
Data validation list	Percentage of data validation failures / total patients ever at facility. Green tick if < 2%.	0,59%	✓
Monthly club report	Number of clubs expected to meet last month - number of clubs captured for last month. Green tick if 0.	0	✓
Workload report	Visits (both TB & HIV) captured last month / visits captured previous month. Green tick if above previous month.	Below previous month	✗
NA	Last backup date. Green tick if < 48 hours ago.	2026/03/06	✗

Tier.Net monthly summary report output

Review the output. For example, you might see “Total on ART: 1,200” or “LTFU this month: 5”. These are important indicators – total on ART tells you your facility’s current caseload; LTFU (lost) indicates how many patients defaulted recently.

1. Cohort (Retention) Report: Find the Cohort analysis or Retention report. In some Tier.Net versions, it might be under a “Quarterly Cohort” menu. Select a cohort start period (e.g., patients who started ART in Q1 2022 – Jan-Mar 2022). Generate the report, which will show outcomes at 12 months (or 24 months) for that cohort. Key outcomes include: % alive and on treatment, % dead, % LTFU, % transferred out, etc.
   (Screenshot: Tier.Net 12-month cohort outcome report example)

Identify one or two key numbers e.g.: “12-month retention rate = 80%” (meaning 80% of that cohort were still on treatment after a year). Also note if, say, 10% died and 10% were LTFU. These outcomes help you gauge performance of the program in retaining patients.

1. Patient Lists (if needed): Tier.Net also allows you to list names of patients who fall into certain categories (e.g., list of patients LTFU). While patient names are beyond our scope in this training (and confidential), know that such lists exist. For management purposes, you might request your data clerk for a list of defaulters to follow up.
2. Exporting Data: Tier.Net reports can usually be exported or printed. Look for an “Export” or “Print to PDF” option in the report view. If you wanted to analyze further, you could export the data to Excel. (If an export function is not obvious, a workaround is that some Tier.Net data can be synchronized with DHIS, or the data clerk can extract the database. For now, we will assume we use the on-screen reports or printouts.)

Checking Data Quality in Tier.Net

Data quality in Tier.Net involves ensuring completeness of patient records and accuracy. Here are a few checks a manager can consider:

- **Are all active patients captured?** Compare the number of active ART patients in Tier.Net to what is reported in DHIS for the facility (DHIS might have an indicator for "ART patients currently on treatment"). They should roughly match. If Tier.Net shows 1200 and DHIS reports 900, investigate the discrepancy – it could mean data hasn't been updated or reporting issues.
- **Are outcomes updated?** Check if patients who missed appointments are being updated as lost to follow-up in a timely manner (e.g., the LTFU count seems reasonable). If LTFU is zero for months, that might be a red flag that defaulters aren't being recorded.
- **Duplicates or errors:** Tier.Net has some data validation, but if you have access, you might ask the data clerk if there are any duplicate patient records or obvious errors (like impossible dates).

As a manager, encourage good data quality practices → regular updating of patient outcomes and monthly backups of the Tier.Net data.

Activity: Interpreting Tier.Net Output

Exercise: Based on the Tier.Net reports you accessed (or the sample provided by the facilitator), answer the following:

- **Active ART Patients:** How many patients are currently on ART in your facility (or sample facility) according to Tier.Net? Is this number increasing or stable compared to last quarter?
  Answer: Currently on ART = __ patients. (Increasing/stable/declining compared to last quarter).
- **Lost to Follow-Up (LTFU):** How many patients were recorded as LTFU in the last month or cohort? What does this number tell you?
  Answer: LTFU = _ (in last month/cohort). This indicates _____.
- **12-month Retention:** If you have a 12-month cohort report, what is the retention rate at 12 months? (i.e., % on treatment after 1 year). Is it above or below the national benchmark (for example, many programs aim for ~80% or higher)?
  Answer: 12-month retention = __%. (Above/Below target?).
- **Data Quality Note:** Do the Tier.Net figures align with DHIS reports for the same indicators? (For instance, DHIS might have a "ART patients currently on treatment" number via a routine report – compare if possible.)
  Answer: Alignment with DHIS? Yes/No, comment: _____.

Reflect on these numbers. What might be a priority issue for your HIV programme? For example, *"We have a high number of patients LTFU, which suggests we need better follow-up mechanisms"* or *"Our 12-month retention is only 75%, below the 85% target – we might need to investigate why patients drop off within a year."* Jot down one insight:
Insight: _____.

Using ETR.Net for TB Programme Data

Now we'll examine the **ETR.Net** system to retrieve tuberculosis (TB) program data. In many districts, TB data is compiled by program staff rather than by each facility manager, but it's still useful for PHC managers to understand and use TB data, since TB is often managed alongside PHC services. We will focus on the reports that ETR.Net produces for TB outcomes.

Accessing ETR.Net

1. **Opening ETR.Net:** If available, launch the ETR.Net software on your computer. (It may not be installed on all machines; if not, the facilitator will share TB reports in print or PDF.) ETR.Net usually does not require individual logins in the same way (access is often limited to TB coordinators). For our purposes, assume you have access to view the data or have gotten a printout from the TB coordinator.
   (Screenshot: ETR.Net main interface or login window)
2. **Select Dataset:** ETR.Net might ask you to select the **sub-district/district and time period** for which you want to view data. Typically, data is organized by quarter because TB outcomes are measured in quarterly cohorts. Ensure you pick the appropriate location (your district or sub-district) if prompted.

Retrieving TB Indicators in ETR.Net

ETR.Net's most important outputs are the **Case Finding report** and the **Treatment Outcomes report**. Let's see what each provides:

- **Case Finding (Notification) Report:** This report shows how many TB cases were notified (registered) in a given period, often broken down by category (new cases, relapses, etc.). It might include indicators like TB incidence or case detection rate if linked to population data.
- **Treatment Outcomes Cohort Report:** This is usually for a cohort of TB patients who started treatment in a given quarter, and their outcomes after a fixed period (e.g., 6-8 months for drug-sensitive TB treatment). Outcomes include: Cured, Completed treatment, Died, Failed, Lost to follow-up (defaulted), and Not evaluated. From these, key performance indicators are calculated, such as **Treatment Success Rate** (cured + completed) and **Lost to Follow-Up Rate**.

Follow these steps to get the information:

1. **Generate Treatment Outcomes for a Cohort:** Find the **Outcomes** or **Cohort** report section. For example, select the cohort of patients who started TB treatment in **Q1 2022** (Jan–Mar 2022). Generate the report. It should display something like: "Number of cases: 100. Outcomes: Cured: 70, Completed: 10, Died: 5, Failed: 2, Lost: 8, Not evaluated: 5" (these are hypothetical). From this:
2. Treatment Success = (Cured + Completed) out of total, which in this example is 80/100 = 80%.
3. Lost to Follow-up = 8%, Death rate = 5%, etc.
   (Screenshot: ETR.Net treatment outcome report example table)

Note down the **Treatment Success Rate (%)** and **LTFU (Default) rate** for that cohort. These are critical indicators for TB program performance.

1. **View Case Finding Data:** Next, look at the **Case Finding or Notification** data for the recent period (e.g., the same quarter or the entire year 2022). This might show total TB cases notified in the district. For example, "New pulmonary TB cases: 300, Relapses: 20, Total: 320." It might also show HIV co-infection rates (e.g., how many of those TB patients are HIV-positive).
   (Screenshot: ETR.Net TB case finding report snippet)

Identify one or two figures, like *"Total TB cases in Q1 2022 = ___"* or *"TB/HIV co-infection rate = ___%"*.

1. **Exporting/Printing:** ETR.Net reports can often be printed. If there's an export to Excel, you can use that to further analyze, but usually printouts are used in meetings. Ensure you have the data written down for reference.

Checking Data Quality in ETR.Net

Because ETR.Net data comes from paper registers, one aspect of completeness is whether all facilities sent in their data. If a facility's data was not entered, it would show up as missing in sub-district totals. In practice, TB coordinators verify that all clinics submit their quarterly TB reports.

A quick check for you as a manager: **Does the number of TB cases in ETR.Net roughly match what's reported in DHIS?** DHIS may have a monthly aggregate count of TB cases started on treatment. If DHIS shows 50 cases for your clinic in a quarter and ETR.Net shows only 40, some cases might not have been captured in ETR (or vice versa). Reconcile these with the help of your info officer if needed.

Activity: Analysing TB Programme Data

Exercise: Using the ETR.Net output provided (or hypothetical data given by the facilitator):

- **TB Treatment Success Rate:** For the latest cohort you reviewed, what is the treatment success rate? *(This is the % of patients who were cured or completed treatment out of the cohort.)*
  Answer: Treatment Success Rate (e.g., Q1 2022 cohort) = _%.
- **TB Lost to Follow-Up:** What percentage of that cohort was lost to follow-up (defaulted)?
  Answer: LTFU/Default Rate = _%.
- **TB Cases and Trends:** How many TB cases were notified in the last year (or last quarter) in your district? Is TB case notification increasing, decreasing, or stable compared to previous periods?
  Answer: TB cases notified = _. Trend appears to be (increasing/decreasing/stable) compared to last year.
- **TB/HIV Co-infection:** (If data available) What percentage of TB patients in the cohort are HIV positive?
  Answer: TB/HIV co-infection rate = _%.

Consider these results and **identify one area of concern** for TB in your facility/district. For instance, *"Treatment success is only 75%, below the 90% target – mainly due to a high default rate of 10%. We need to improve patient support and follow-up."* Write a brief note on a priority action you might consider for TB:
Priority for TB programme: _____.

Using the District Health Barometer (DHB) Dashboard

Having explored the individual data systems, we now turn to the **District Health Barometer (DHB)** – a powerful tool for visualizing and comparing health indicators. The DHB aggregates much of the data from DHIS (and other sources) and presents it in an easy-to-use online dashboard. This session will be more interactive: you will get to practice navigating the DHB website to find your district's data, create visual comparisons, and identify strengths and gaps.

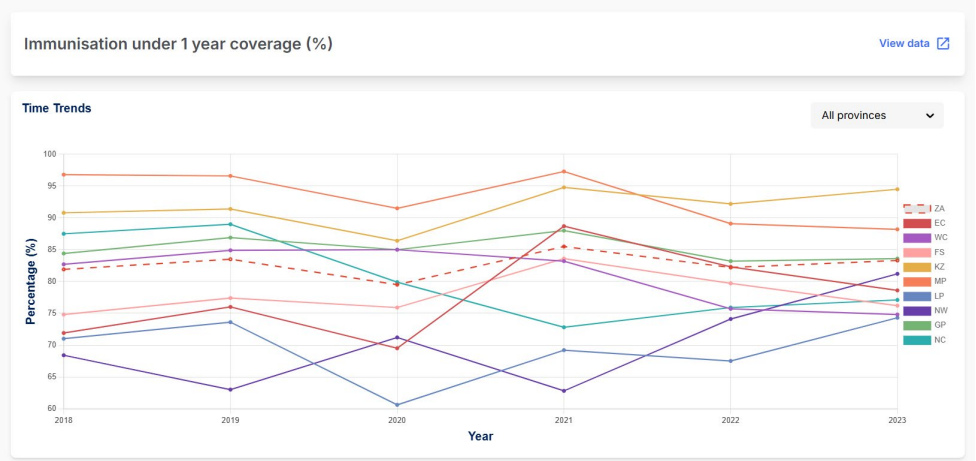
Navigating the DHB Step-by-Step

Follow these steps to use the DHB online dashboard (you can do this individually or in pairs):

1. **Open the DHB Website:** Go to **https://dhb.hst.org.za** in your web browser. The homepage will typically show a welcome and perhaps some summary graphs. You may see options or a menu for different indicator domains (like "Maternal & Child Health", "HIV/TB", "Non-Communicable Diseases", etc.).
2. **Choose a Health Theme:** Click on a theme or category that interests you. For example, select **"RMNCH"** (Reproductive, Maternal, Newborn & Child Health) or **"Infectious Diseases"** or any other category listed. This will filter the available indicators to that program area.
3. **Select an Indicator:** Within the chosen theme, find a specific indicator. For instance, under RMNCH you might pick **"Antenatal 1st visit before 20 weeks (%)"** or **"Immunisation coverage <1 year (%)"**; under Infectious Diseases, you could select **"TB Cure Rate (%)"** or **"HIV Viral Load Suppression (%)"**, etc.. Use the dropdown or list to click on the indicator name. The page will then load a chart for that indicator.
4. **Filter by Location:** Above or beside the chart, there will be filters for **Province, District, and Sub-district**. Choose your **Province**, then your **District** from the dropdowns. The chart will update to show data for your district. *(If sub-district data is available for that indicator, you can also select a sub-district to drill down, but initially view the whole district.)*
5. **Select Time Period:** Look for a time filter or slider. Usually, the DHB lets you view the **latest year** or a **trend over multiple years**. For a quick view, ensure the latest year is selected. To see trends, select a range (e.g., the last 5 years) or toggle a switch for "trend view". The chart might change from a map or bar (for one year) to a line chart (for multi-year trend).
6. **Read the Visual:** Examine the chart carefully. Check the **axis labels and legends** to understand what is being shown. For example, a line chart might show year on the x-axis and percentage on the y-axis. Hover your mouse over data points (if using a computer) to see exact values for each year (the DHB dashboard often shows values when you hover). Note the latest value for your district and how it has changed.
7. **Compare with Peers:** The DHB has features to compare your district with others or with the provincial average. For example, you might see a list of district names below the chart – by clicking another district's name, its line will appear on the chart for comparison. Or there may be a checkbox for "Show Provincial Average/National Average". Use these to see how your district stacks up. Is your district above or below the provincial average? Are you improving faster or slower than others?

8. **Export or Screenshot (Optional):** The DHB dashboard usually has a download button to save the graph or the data. You might download the chart as an image or the data as a CSV. This is optional; you can also just take a screenshot if you want to include the graph in a report.

Following these steps, you should be able to retrieve a chart of interest. **For example:** you could produce a graph of your district's immunization coverage trend over 5 years and compare it to the province's trend. Or see a bar chart of the latest TB cure rates for all districts in your province to see where you rank.



Tip: Always consider the context of an indicator when interpreting it. For instance, a **higher value** is usually positive for coverage indicators (e.g., higher immunization % is good), but a **lower value** is positive for things like disease incidence or patient default rates (lower TB incidence is good, lower default rate is good). Be mindful of whether you want the values to increase or decrease. Also, check if there are any targets or benchmarks indicated on the chart (some DHB charts may show target lines).

Activity: Hands-On with the DHB

Try it yourself: Use the DHB dashboard to explore and record the following:

- **Indicator Check (DHB):** Find **two indicators** on the DHB for your district – one from *RMNCH (e.g., ANC, immunization or delivery indicators)* and one from *another category (e.g., Infectious diseases or Health Outcomes)*. For each indicator, note:
- The **latest available value** for your district (include year, e.g., "2021: 64%").
- The **5-year trend** (e.g., "increased from 50% to 64% from 2016 to 2021").
- How your district compares to the **provincial average or best/worst district** (e.g., "slightly below provincial average of 70%" or "2nd highest in province").

Indicator 1 (RMNCH): ___ – Latest value = _; Trend = __*; Comparison =* ___.
Indicator 2 (Other): ___ *– Latest value = _; Trend =* __; Comparison = ___.

- **Benchmarking:** Identify **where your district ranks** for one of these indicators. Is it among the top performers, middle of the pack, or lagging? (The DHB might show a provincial bar chart or ranking – or you can infer by comparing values of districts.)
  Ranking note: _____.

- **Strength and Gap:** From the two indicators you examined, name **one positive finding** for your district (a strength) and **one negative finding** (a gap). For example, a positive might be "Immunization coverage improved significantly and is above 90% (strength)", and a gap might be "TB cure rate dropped and is the lowest in the province (gap)".
  Strength: _____
  Gap: _____

Write your findings in the space above. We will share some of these in plenary. Understanding these will help you in the next step of prioritizing and planning.

Interpreting Data and Communicating Insights

By now, you have gathered a variety of data: routine service stats from DHIS, patient outcomes from Tier.Net/ETR.Net, and comparative indicators from the DHB. The next crucial step is **making sense of this data** – turning numbers into insights, and insights into action. In this section, we focus on interpreting what the data is telling us, writing those insights clearly, and then planning SMART actions for improvement.

Making Sense of the Numbers: Key Questions

Whenever you look at a data indicator, ask yourself a few key questions to interpret it:

Trend
Is the indicator value **increasing, decreasing, or flat over time**? An improving trend (upward for good indicators or downward for bad ones) is positive, while a declining trend is concerning. Flat trends might indicate stagnation. Always consider at least 2-3 past points to judge direction.

Target/Benchmark: How does the value compare to any **target** or standard? For example, if immunization coverage is 85% but the target is 90%, there is a gap to close. If ART retention is 78% and the national goal is 85%, that's an issue. Targets can be official (national targets) or your own internal goals.

Comparison/Equity: How does your value compare to **others**? This includes comparing to the provincial or national average (as we did with DHB) and looking at differences **within** your area (e.g., one sub-district vs another, or one facility vs another). Are there big disparities? For instance, one clinic might have much lower performance – indicating an equity gap that needs addressing.

Volume and Context: Consider the denominators and context. A percentage might be high or low partly due to denominators. For example, 50% ANC <20 weeks might seem low, but if it's a very high-volume facility with specific challenges, context matters. Also consider external factors: did any changes or interventions happen that could explain trends (policy changes, staff shortages, etc.)?

Data Quality: Is the data reliable? Before panicking about a weird number, double-check if data might be incomplete or incorrectly captured. Anomalies might be data errors. Ensure you trust the data before basing decisions on it.

Keep these in mind as you analyze. Now, we'll practice **articulating insights** from the data.

Writing Data Insights

A **data insight** is a concise statement that summarizes what the data is showing and why it matters. It's more than just restating a number – it interprets the significance. For example: *"Only 60% of pregnant women in our district attend antenatal care before 20 weeks, a rate that has improved from 50% five years ago but remains below the 80% target. This indicates persistent delays in early antenatal booking, possibly due to late health-seeking or access issues."*

When writing an insight, try to include:

- **What**: The indicator and the current value (and trend if relevant).
- **So what**: Why is this important? Compare to target or other areas to give it meaning.
- **Because** (if known): A hint of the cause or implication, if you have an idea (this can lead to action planning).

Example Insight: "Our clinic's **12-month ART retention rate** is 75%, which has declined from 85% two years ago and is below the provincial average of 80%. This means **1 in 4 patients** are no longer on treatment after a year, reflecting challenges in keeping patients engaged in care – possibly due to inadequate follow-up of missed appointments."

Now you try:

Exercise – Write an Insight: Choose **one key finding** from any data you've looked at (it could be the strength or gap you identified in the DHB exercise, or something from DHIS/Tier.Net). In the space below, write 2-3 sentences that form an insight. Be clear and specific. Mention the indicator, the value/trend, and why it matters.

Insight statement:

_____

_____

_____.

(Tip: Imagine you are going to present this in a meeting – would a listener understand the crux of the issue from what you wrote?)

Crafting a Summary Brief

Often, managers need to communicate a broader picture in a **summary report or brief** – for example, a quarterly performance report for a sub-district. This usually involves writing a short narrative (a few paragraphs) that highlights the main points from the data, and sometimes includes tables or charts.

What to include in a summary:

- **Introduction sentence:** What is the overall focus (e.g., "This report summarizes the Q1 2025 performance of XYZ Clinic in key program areas: Maternal Health, HIV, and TB.").
- **Key achievements or strengths:** Start on a positive note if possible. "Immunization coverage improved to 95%, exceeding the target, and ANC early booking increased by 10 percentage points compared to last year."
- **Key challenges or gaps:** Identify the critical issues. "However, the TB treatment success rate dropped to 75%, below the 85% target, due to an increase in patients lost to follow-up. Additionally, ART 12-month retention remains a concern at 78%."
- **Possible causes or context:** Briefly mention if you know why. "The drop in TB success coincided with staffing shortages in the tracing team. Retention challenges in ART may be linked to drug stock-outs experienced in Feb and Mar."
- **Next steps (if appropriate):** Foreshadow actions. "We plan to strengthen patient follow-up through community health workers and are implementing an early missed-appointment tracking system next quarter."

Keep the language clear and non-technical where possible, especially if the audience includes non-clinical managers or community stakeholders.

Activity – Outline a Brief:

You won't write a full report here, but sketch an outline for a short summary you might give for your facility/district based on the data we've examined. Bullet points are fine:

- **Introduction:** What period and scope? (e.g., "Q1 2025, District ABC performance summary").
- **Highlights (Good):** 1-2 bullets of good performance.
- **Issues (Bad):** 1-3 bullets of under-performance.
- **Underlying factors:** any known reasons (optional).
- **Action:**

Outline:
- Introduction: _____
- Good: **_____**
- Good: **_____**
- Gap: **_____**
- Gap: _____
- Cause: _____
- Action/Plan: **_____**

This outline can guide you when writing an actual report. For practice, you can expand any one bullet into a full sentence in your own words as if writing the narrative. Discuss with peers for feedback – does it make sense, is it evidence-based?

SMART Action Planning

Data becomes meaningful when it leads to action. We will use the **SMART** framework to plan an intervention for an identified gap. Recall:
- **S**pecific (clear and focused on one issue),
- **M**easurable (with a quantifiable target),
- **A**chievable (realistic given resources),
- **R**elevant (addresses the problem and aligns with priorities),
- **T**ime-bound (has a deadline).

Template: We will fill out a mini action planning table. Choose **one priority problem/indicator** from your data (perhaps the gap you identified earlier). For that indicator, set a baseline, a target, and list actions.

Below is an example (from the maternal health domain):

Indicator	Baseline (Year)	Target (By when)	Why this target?	2-3 Key Actions (How)	Owner (Who)
Example: ANC <20 weeks (%)	*60% (2023/24)*	*75% (by Mar 2026)*	*Close gap vs prov. 72%; feasible with outreach*	*- CHW early booking drives* *- Fast-track first visits* *- Monthly cohort review*	*Clinic manager*

Now your turn: Use the blank template below to plan for your chosen indicator.

Indicator	Baseline (Year)	Target (By when)	Why this target?	2-3 Key Actions (How)	Owner (Who)
< Fill in your indicator >	< e.g., 60% (2023) >	< e.g., 75% (2025) >	< rationale (why not higher/lower?) >	< Action 1 > < Action 2 > < Action 3 (optional) >	< Person/team >

Take a few minutes to think this through. For example, if the problem is low TB success rate (75%), maybe target 85% by next year. Why 85%? (Provincial target is 90%, but 85% is achievable with given resources). Key actions might include “Reactivate tracer teams to follow up defaulters”, “Weekly review of missed doses”, “Community awareness campaign to support treatment adherence”. Owner could be “Facility TB nurse with support from sub-district TB coordinator”.

Remember to keep targets **ambitious yet achievable**. Setting it too low isn’t inspiring, too high might be unrealistic and demotivating. You can always adjust as you implement.

Day 4: Quality Improvement (QI) and Data Communication Training: (The Quality Quest, Becoming a Data Hero!)

Day Overview

Today's focus:

- Process and lean mapping
- Root cause analysis
- Quality improvement (QI) monitoring and evaluation
- Plan-Do-Study-Act (PDSA) Cycles
- Communicating data results

Session at-a-glance

#	Session	Time (min)
4.1	Introduction to Quality and Quality Improvement	15
4.2	Developing a QI Aim Statement	20
4.3	Process Mapping	60
4.4	Gemba Walks – Observing Work Where It Happens	30
4.5	Root Cause Analysis (5 Whys & Fishbone)	30
4.6	Developing Change Ideas	90
4.7	Plan-Do-Study-Act (PDSA) Cycles	100
4.8	Wrap-up and Reflection	15

Introduction

From Insight to Action, Your Hero Mission

Welcome to the most critical and action-oriented day of our program! Over the past three days, you've mastered data, the essential fuel for informed decision-making by gathering, organizing, visualizing, and interpreting information.

Today, all that power comes alive as you learn to translate metrics into measurable motion. You take the final, powerful step: converting raw knowledge and daily frustrations into tangible, systematic improvements that benefit your patients and empower your colleagues. You are now stepping into the essential, transformative role of a Change Agent, ready to lead with data.

Learning outcomes for the quality improvement

By the end of this training, participants will be able to:

- Explain the principles and importance of Quality Improvement (QI) in strengthening primary health care service delivery.
- Apply process mapping and waste analysis to identify inefficiencies, bottlenecks, and opportunities for improvement in health care processes.
- Use root cause analysis tools such as the "5 Whys" and Fishbone diagram to identify and address underlying causes of quality and performance gaps.
- Design and implement Plan-Do-Study-Act (PDSA) cycles to test, refine, and scale up improvement interventions in their work settings.
- Monitor and evaluate QI initiatives by developing and using appropriate indicators, data collection tools, and feedback mechanisms.
- Analyse and interpret QI data to assess progress, identify trends, and inform decision-making.
- Communicate data results effectively through visual presentations, summaries, and reports tailored to different audiences.
- Use data storytelling and feedback to engage stakeholders, promote accountability, and sustain quality improvement initiatives within PHC facilities.

Quality in healthcare

Definition

"Quality in healthcare is care that is effective, safe and provides as positive an experience as possible by being caring, responsive and person-centred" (The Health Foundation, 2021).

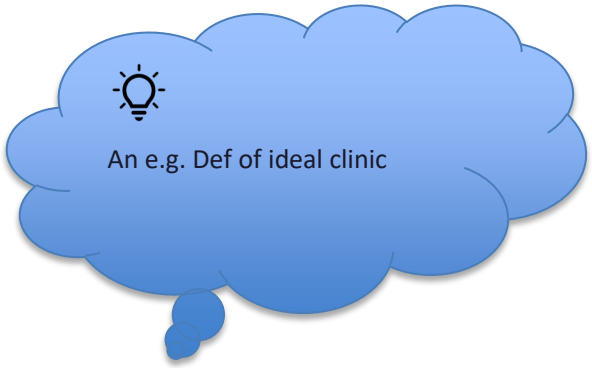
It is also defined as "The degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge" (e-Source. Behavioural & Social Sciences Research).

The dimensions of quality

Table 1: Dimensions of quality

For people who use services	For those providing services
• **Safe - Avoiding harm to people from care that is intended to help them**	• **Well-led** - They are open and collaborate internally and externally and are committed to learning and improvement.
• **Effective - Providing services based on evidence that produce a clear benefit**	• **Sustainable** - They use their resources responsibly and efficiently, providing fair access to all, and according to need of their populations.

• **Experience**
  • **Caring. Staff involve and treat people with compassion, dignity and respect.**
  • **Responsive and person-centred. Services respond to people's needs and choices and enable them to be equal partners in their own care**
	• **Equitable** - They provide care that does not vary in quality because of a person's characteristics.



The model for quality improvement

Definition

"Quality improvement is about giving the people closest to issues affecting care quality the time, permission, skills and resources they need to solve them. It involves a systematic and coordinated approach to solving a problem using specific methods and tools with the aim of bringing about a measurable improvement" (The Health Foundation, 2021).

Foundations of quality improvement

Before formulating improvement plans, it is important for the team to understand the basic principles of improvement. There are five important foundation stones on which to build a quality improvement process:

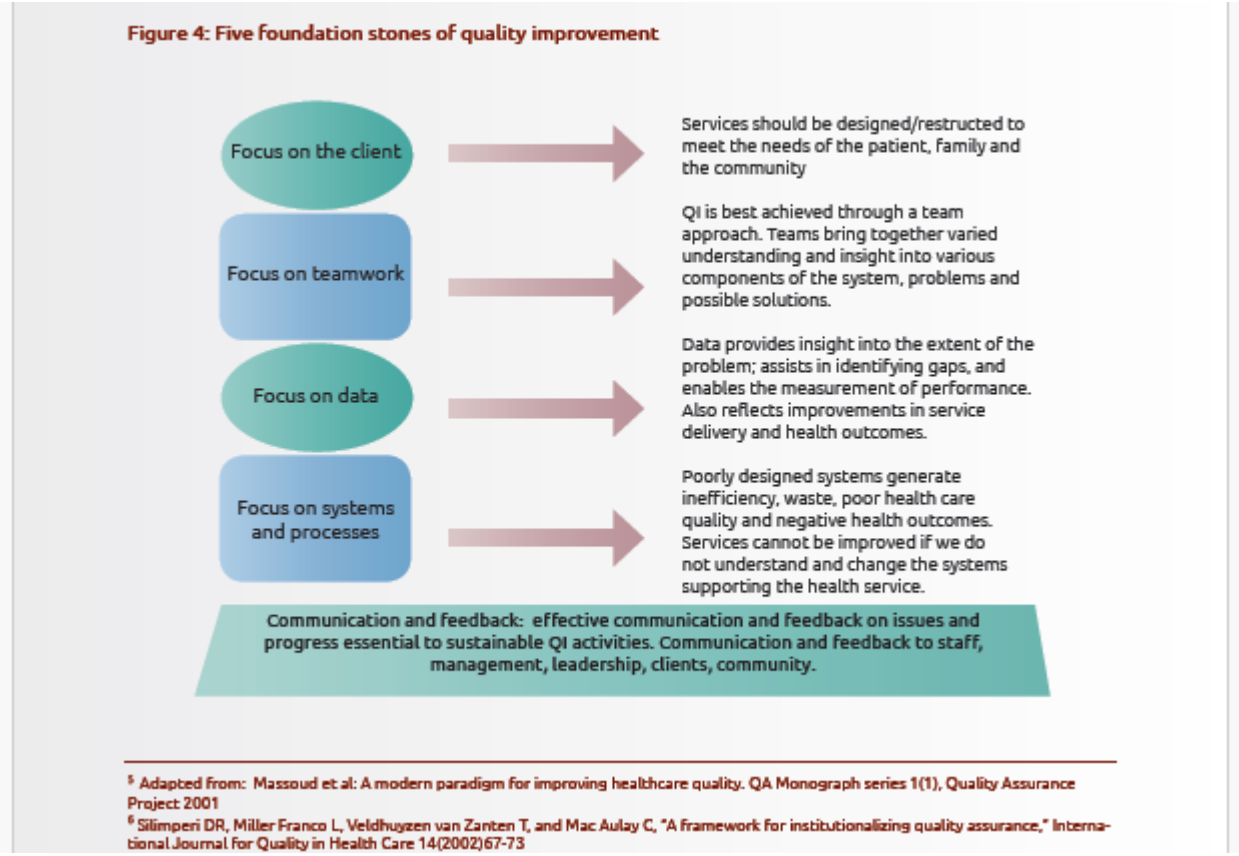


Figure 1 - Five foundation stones for quality improvement. (NDOH, 2012)

Quality measurement

Your Mission Today – talk about the Model for Improvement.

We will leverage the **three core method**s used globally in high-performing healthcare quality improvement (QI) initiatives to structure your work, providing you with a disciplined, proven framework for continuous innovation:

- **Process Mapping**, to visually document the current workflow, dissecting it to see exactly where inefficiencies and potential failures hide.
- **Root Cause Analysis (RCA)**, to dig past symptoms and truly understand the underlying, often hidden, systemic reasons *why* failures persist.
- **PDSA Cycles**, to **test** proposed solutions safely, quickly, and at a minimal cost before committing to a wide-scale rollout.

Your Mind-set: Embrace the role of a meticulous detective, not a subjective judge. The true targets for improvement are the **processes and systems**, which harbour latent errors, not the dedicated people who work within them. Every bottleneck is a critical clue, and every defect is an invaluable chance to innovate and build a more resilient system for tomorrow.

NB: Not all changes are improvements but all improvement involves change. Changing the systems that deliver care has thus become the cornerstone of the movement that is now referred to as medical quality improvement (Batalden P et al (2012).

Mini Story:

"Imagine a dedicated nurse sighing at the front desk: another delay, another missed appointment, and another frustrated colleague. This recurring cycle often leads to reduced quality of care and staff burnout. What if that pervasive, daily frustration could be systematically converted into a permanent, actionable improvement, protecting both staff and patients? Today, armed with data and a clear methodology, it absolutely can be done.

Process Mapping

Hunting for Waste (The Detective's Map)

Learning outcomes

By the end of this session, participants should be able to:

- Define process mapping and explain its importance in identifying inefficiencies in healthcare workflows.
- Construct a simple process map to illustrate patient flow or service delivery steps within their facility.
- Identify points of delay, duplication, or waste (time, effort, or resources) in existing processes.
- Propose practical strategies to reduce waste and streamline service delivery for improved patient outcomes.

Concept: Capturing the Current Reality ("As-Is")

Definitions

A **process** is a series of connected steps or actions to achieve an output, with both a starting and an end point. The process is part of a larger system. It answers the questions, "Did this patient receive the right care".

Process mapping is often used to represent a patient's care pathway. For example, the admissions procedure, transferring from one unit to the next, getting a child immunised, or getting tested for HIV. These processes all interact with the system as a whole and require inputs along each step in the path (NDOH, 2012).

Process mapping creates a visual tool to analyse a series of activities in order to identify barriers, bottlenecks, duplication of efforts, waste and/or unnecessary steps that are causing problems. A team approach creates an opportunity to bring together different ideas and perspectives from all members involved in the process. It allows a team to identify problems and opportunities to improve (NDOH, 2012).

A **Process Map** is your objective GPS for clinic operations, providing a standardized, shared understanding of a procedure. It is a visual representation of all steps, decisions, and handoffs from a defined start to an end point, ensuring no operational assumption is left unchallenged.

Table 3: Process map and importance of boundaries.

Why Map It?	Boundaries Matter
Consensus Building: It forces all team members, regardless of role or tenure, to agree on the exact sequence of events, eliminating confusion and subjective opinions about "how things are done."	**Scope Control:** Always define a clear **Start Point** and **End Point**, without defined boundaries, your map quickly becomes an unmanageable, tangled **spaghetti**! This focus ensures your project is both concise and manageable.
Visualizing Waste: It immediately highlights duplication, unnecessary movement, and hidden wastes that are functionally invisible during routine operation.	**Risk Management:** Mapping without strict boundaries risks overwhelming the team and allowing the project scope creep out of control, jeopardizing completion.
Identifying Critical Handoffs: It explicitly identifies exactly where bottlenecks and handoffs, the most frequent points of communication breakdown and error, occur before they cause chaos.	**Clarity of Focus:** Concentrate rigorously on one specific process first, e.g. "Patient check-in" (start) to "Patient seated" (end), before tackling larger workflows.

Problem statement

Long waiting times

It is important to understand the process that a client follows when accessing health services at a health facility. This is crucial because every facility is expected to have systems and processes in place to meet clients' needs and minimize the risk of patients spending excessive time in the facility, which may expose them to additional health risks such as cross-infection.

The figure below illustrates how a client moved through several service points over a period of almost twelve hours to access health services. The client could have spent significantly less time if the facility had more efficient systems and processes to deliver quality care.

Here is an example of long patient waiting time:

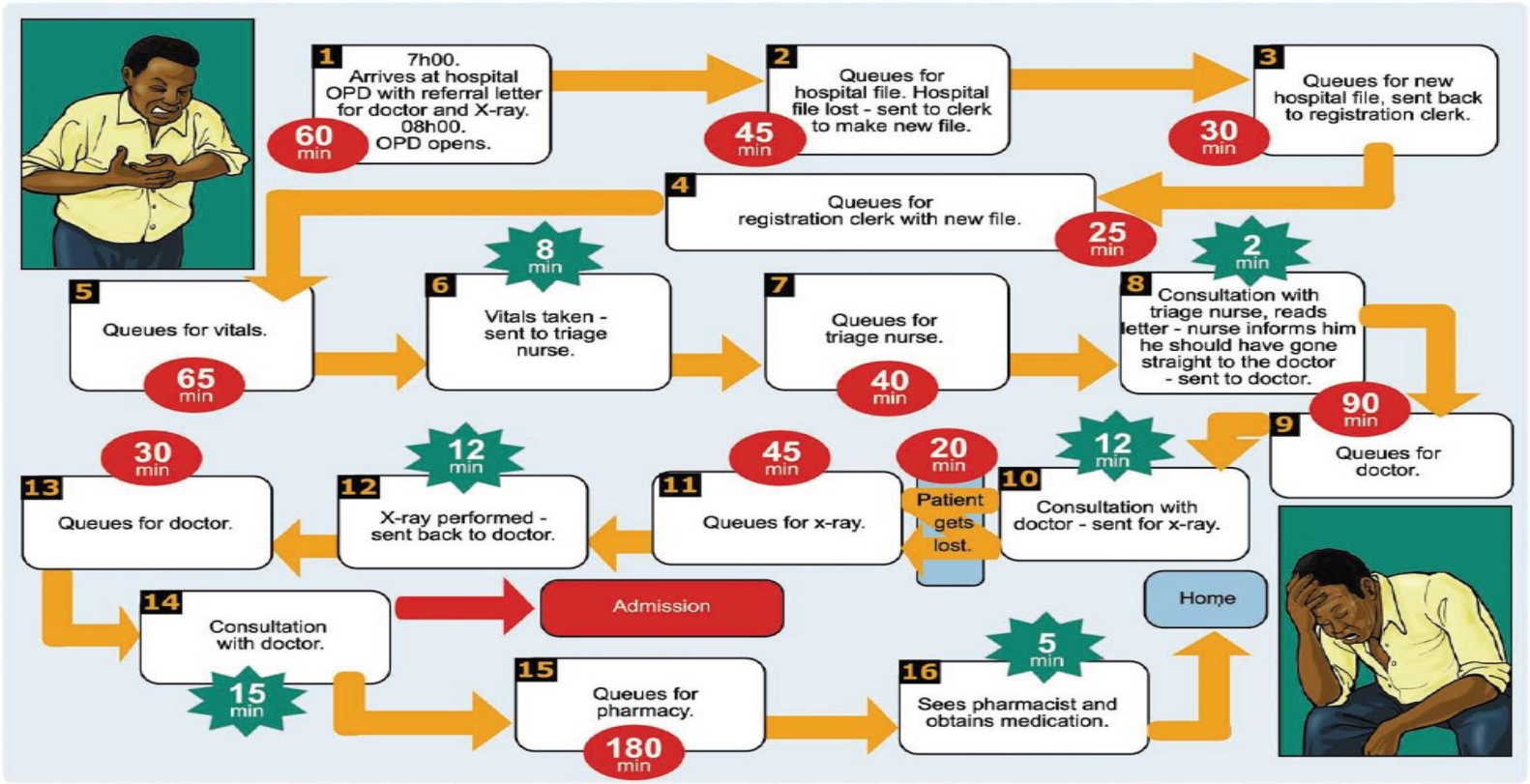

1
7h00.
Arrives at hospital OPD with referral letter for doctor and X-ray.
08h00.
OPD opens.
60 min
2
Queues for hospital file. Hospital file lost - sent to clerk to make new file.
45 min
3
Queues for new hospital file, sent back to registration clerk.
30 min
4
Queues for registration clerk with new file.
25 min
5
Queues for vitals.
65 min
8 min
6
Vitals taken - sent to triage nurse.
7
Queues for triage nurse.
40 min
2 min
8
Consultation with triage nurse, reads letter - nurse informs him he should have gone straight to the doctor - sent to doctor.
90 min
9
Queues for doctor.
12 min
10
Consultation with doctor - sent for x-ray.
20 min
Patient gets lost.
45 min
11
Queues for x-ray.
12 min
12
X-ray performed - sent back to doctor.
30 min
13
Queues for doctor.
14
Consultation with doctor.
15 min
Admission
15
Queues for pharmacy.
180 min
5 min
16
Sees pharmacist and obtains medication.
Home

Figure 2: Sample of process map (NDOH: 2012)

Notes on Figure 2 sample process map for long patient waiting time

Mr Jacobs has been referred from a primary health clinic for an x-ray for chest pains.

He arrives at the hospital at 07h00 and departs at 18h24. He spends 11 hours and 24 minutes at the hospital.

Out of the 11 hours 24 minutes, he spends 54 minutes (3.6%) of his time with various health care providers. 10 hours 10 minutes are spent waiting at service points.

Then divide the participants into groups of 5.

• Hand out a set each of the pre-prepared slips of paper to

each group. Give each group about 3 minutes to analyse & id possible bottlenecks discuss and feedback

the stages of the policy and law-making process

Table 4: Time spent with health care providers

Summary of time spent with health care providers	
Vitals nurse	8min
Triage nurse	2min
Doctor	12min
x-ray	15min
Pharmacist	5min
TOTAL	**54min**

From the point of entering the hospital to leaving, Mr Jacobs goes through16 steps.

The following are possible areas for quality improvement interventions:

- Mr Jacobs arrived at 07h00 to try and beat the queue. An appointment system may assist in reducing the early morning bottleneck.
- **Steps 2,3,4** – Improve recordkeeping storage and retrieval, he had to queue for his file (45 min,
- **step 2**) queue for a new file to be opened (30 min, **step 3**) and then return to the reception area to register the new file (25 min, **step 4**).
- He had a referral for the doctor, so the system for triage could be improved. He queued 40 min for the triage nurse (**step 7**), saw her for 2 min (**step 8**) who told him he should have gone straight to the doctor – patients with referral letters can be fast tracked, without going through the triage system.

- **Steps 5-8**, with a comb**ined w**aiting time of 1 hour **45 mi**n for vitals and triage, need to be looked at in terms of replication, unnecessary queuing, and combining vitals with triage)
- He got lost going to the x-ray department (between **steps 10 and 11**) and was directed to the wrong unit. Signage could be improved.
- A focused look at the x-ray department to look at how the system may be improved may yield improvements to the waiting time (45 min, **step 11**).
- His return to the doctor with his results could be expedited, so that he does not have to queue again.
- The queue of three hours for the pharmacy (**step 15**) needs to be analysed and improved –subsystems of dispensing, packaging, new prescriptions and repeats etc.

Using the core standards with process mapping

In order to attain the quality of care defined by the core standards, teams can map out the standard (or set of standards) that directly correspond to the steps in the patient's care pathway. This will guide teams to develop improvement plans, which are aligned to key standards or priority areas in need of urgent intervention. For example:

- Standards related to infection control can be linked to several steps in a patient's journey to access treatment (e.g. antiretroviral therapy) and teams can focus on these steps when creating improvement plans for non-compliant infection control measures.
- A queue marshal may be needed along key steps of the patient care path but currently is only being used at the facility entrance. Teams can identify bottlenecks and expand the work areas of the queue marshals.
- Furthermore, the analysis can help identify a range of quality issues, such as areas where patients may become lost or frustrated, thereby providing clues as to why a health facility may be noncompliant with key standards related to access or patient rights.

As in the patient care pathway in figure 5, potential bottlenecks, failures or wastages have been identified in order to improve patient care and safety.

QI initiatives

- Cues or prompts to complete blood collection request form (Analysing Flow)

Completing blood request forms should be an error-free process. Health care providers, such as doctors and nurses, already have demanding workloads, and incorporating prompts or cues on the blood specimen request form can make completion easier and more accurate. This helps prevent delays in laboratory processing and the release of results.

Such cues could include clearly identifying mandatory fields that must be completed, along with reminders to ensure these sections are not left blank. Additionally, digitalising the completion process with built-in prompts for mandatory information can further enhance accuracy and efficiency, ultimately improving service delivery.

Below is an example of how a nurse had to wait for a doctor who missed to sign and write the time of blood collection on the lab form to finish what he was doing to sign the form.

Then divide the participants into groups of 5.

• Hand out a set each of the pre-prepared slips of paper to each group. Give each group about 3 minutes to analyse & id possible bottlenecks discuss and feedback

Figure 3: Nurse at the workstation

Let's analyse a familiar chaotic sequence. By mapping it, we use the process diagram as an objective lens to reveal the flaws hidden within the complexity:

i. Doctor fills out lab request.
ii. Nurse collects the form.
iii. Doctor forgot to sign it (**Defect!**).
iv. Nurse walks back (**Motion!**).
v. Nurse waits 10 minutes for Doctor to finish call (**Waiting!**).
vi. Nurse submits to lab.
vii. Lab says: "Time is missing!" (**Defect/Rework!**).

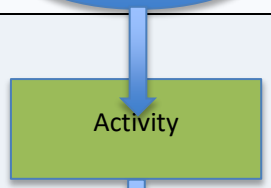
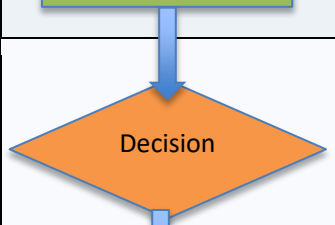
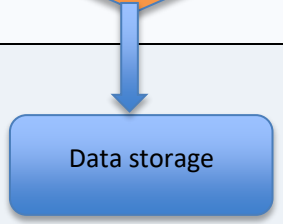
Table 5: Nurse dialogue

Dialogue Example:	Detective Insight:
Nurse: "I just wasted 10 minutes going back and forth!"	**You:** "The problem isn't the urgent call, nor is it the nurse's commitment. The problem is the process **design** that forces a physical movement and creates an un-buffered dependency on the doctor's immediate availability."

Use of symbols on the flowchart

The visual language of flowcharts allows for rapid, universal understanding of complex procedures, transcending language barriers and departmental silos. Visual illustrations are more effective than oral or written formats because graphical examples register faster in the human brain. Process maps consist of symbols, lines, and arrows, which enable us to display workflow steps in a clearer and more concise way. This helps people to follow the process flow without difficulty (Yael et al, 2017).

Table 6: Use of symbols to simplify process mapping

Symbol	Name	Meaning & Essential Function	Clinic Example
Oval		Defines the scope and the specific beginning/end point of the process you are studying.	*Patient arrives at reception / Patient leaves clinic.*
Rectangle		A step where value-added work or a mandatory task is performed.	*Nurse measures patient blood pressure.*
Diamond		A crucial point where the process asks a binary question (Yes/No), leading to divergent paths.	*Is the patient file complete?*
Cylinder		Where information is recorded, stored, or retrieved (physical files or digital records in the EHR).	*Patient records accessed in the EHR system.*

The eight (8) Wastes of Healthcare (DOWNTIME)

Your mission is to find anything that consumes resources (time, materials, energy) but adds absolutely no value to the patient's care experience.

Waste is a non-value adding activity, the customer identifies value as per their desired performance from the product or the service (Ramkrishna et al, 2021).

According to (Ramkrishna et al, 2021), the presence of waste creates inconsistency in care, unreliable delivery, and interruptions in the healthcare delivery system, which results in high cost, errors, and lack of motivation in the workers

Identifying waste as a part of the current system analysis is important in understanding which steps add value to the patient process and which do not. Using process mapping or a fishbone diagram (see below) can help identify where waste or delays occur – this is an important step to complete before initiating the improvement process. Examples of waste are provided in table below:

Table 7: The eight (8) Wastes of Healthcare

Waste Type	Description	Example (Look for the System Failure)
Waiting	Idle time for patients, staff, or critical equipment, often leading to patient anxiety.	Patient waiting 45 minutes **between** two different tests, often pacing nervously in the corridor.
Over-processing	Doing more work than necessary or required by the patient or explicit regulation.	Asking a patient to **verbally confirm and write down** their date of birth on three separate documents.
Motion	Unnecessary physical movement by staff (bending, reaching, walking) that adds no value to the task.	A technician constantly walking back to the supply closet because the room wasn't stocked according to the stocking protocol.

Defects	Errors, mistakes, or rework that requires correction and consumes additional resources.	A **mislabelled specimen** requiring the entire blood draw process to be restarted, damaging patient trust and wasting supplies.
Inventory	Too much or too little stock, leading either to expiry or critical stock-outs.	**Expired syringes** found in the back of the treatment room cabinet due to poor inventory rotation protocols.
Talent	Underutilizing a staff member's high-level skills, knowledge, or intrinsic creativity.	A highly qualified nurse spending hours performing **clerical data entry** instead of deploying high-value clinical skills.
Transportation	Unnecessary movement of materials or items, increasing the risk of damage or loss.	Carrying files **between three separate offices** for approvals before they reach the correct administrative desk.
Over-production	Creating more of something than is currently needed, leading to wasted printing, storage, and review time.	**Printing 50 copies** of a weekly status report that only 5 people will ever read, wasting ink and paper.

Figure 4: Eight wastes in healthcare

Practical Challenge: The Clinic Flow Game (Team Activity)

1. **Task:** Draw a detailed process map for **"Patient comes for a blood test."** This should be your crucial *As-Is* map.
2. **Activity:** Highlight and quantify all 8 wastes using red markers or sticky notes, quantifying the time/steps wasted if possible.
3. **Bonus Game: The Waste Hunter!** Which team can find and label all 4 main types of waste (Waiting, Defect, Motion, Over-processing) in this process first, showing how these wastes naturally interconnect?

Figure 5: Clinic flow game

Root Cause Analysis (RCA), Digging to the Real Problem

Concept: Go Beyond the Obvious Symptom

Learning outcomes

By the end of this session, participants should be able to:

- Explain the purpose and importance of Root Cause Analysis (RCA) in Quality Improvement.
- Apply simple RCA tools such as the **5 Whys** and **Fishbone (Ishikawa) Diagram** to identify underlying causes of quality gaps or service failures.
- Distinguish between symptoms of a problem and its root causes.
- Develop evidence-based solutions that address identified root causes to prevent recurrence of the problem.

The disciplined purpose of Root Cause Analysis (RCA) is to move past the immediate **proximate cause** (what happened) to the **systemic, fixable cause** (why the system failed to protect the patient/staff). Your goal is to identify the points where the process *failed to protect* the patient or the staff member from error. Think of yourself as an objective investigator, focusing on facts.

Table 8: Root cause analysis

Dialogue Example:	Root Cause Insight:
Nurse: “The lab took forever to process my request.” **You (Why?):** “Because the doctor forgot to sign it.” **You (Why?):** "Because there’s no mandatory system reminder."	The problem is not the doctor's memory; it's the **lack of a forced digital checkpoint** or a simple physical reminder mechanism on the form, a preventable flaw in the **methodology** that encourages human error.

The “5 Whys” Game, Detective Deduction

This iterative questioning method is simple but profoundly powerful: repeatedly ask the question "Why?" (Often, fewer or more than five iterations are needed) until the answer points clearly to a fundamental **system or process failure**, explicitly excluding a person's intentional fault.

Table 9: Root cause analysis process

WHY	Answer (The Chain of Causation)
Problem: Patients wait 65 minutes to register. **Why 1?**	Only one clerk has the necessary security credentials and knowledge to operate the new electronic health record (EHR) system efficiently.
Why 5?	**ROOT CAUSE:** Management’s performance metrics heavily prioritize fast, daily patient throughput over allocating necessary time for internal training documentation and cross-departmental standardization, creating a systemic barrier to long-term operational resilience.

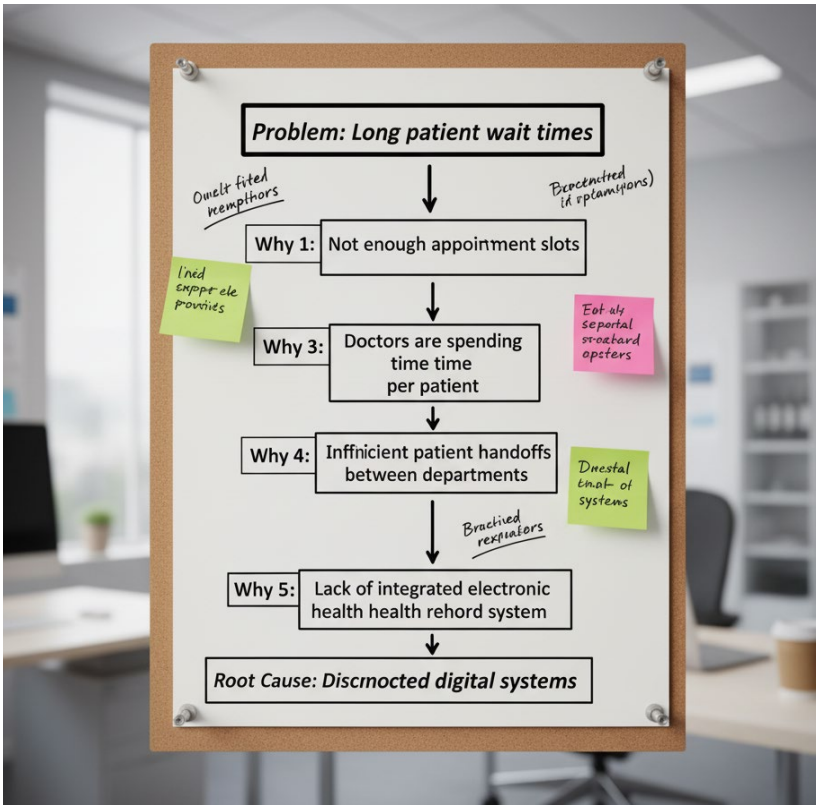

Problem: Long patient wait times
Why 1: Not enough appointment slots
Why 3: Doctors are spending time time per patient
Why 4: Inffnicient patient handoffs between departments
Why 5: Lack of integrated electronic health health rehord system
Root Cause: Discmocted digital systems

Figure 6: Long patient waiting times

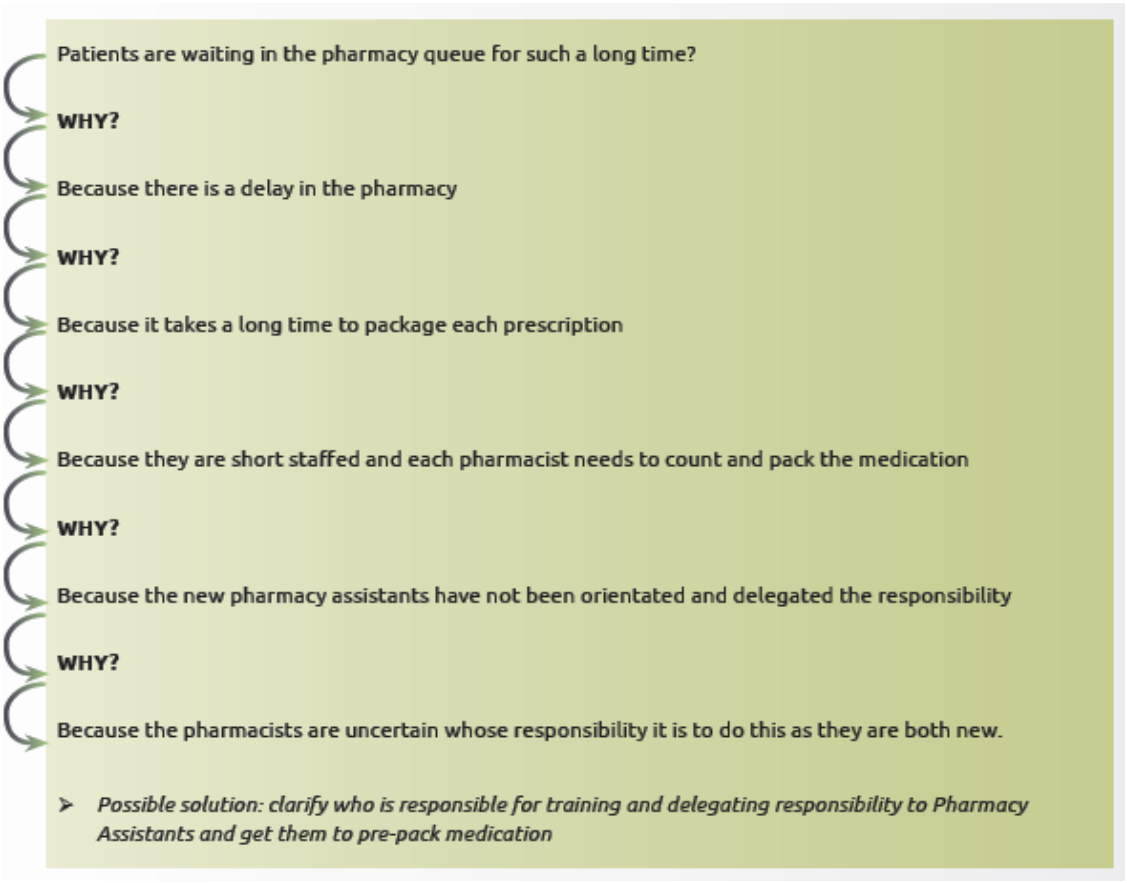


Figure 7: The pharmacy queue is unreasonably long (NDOH, 2012).

Advanced Tool: The Fishbone Diagram (Ishikawa)

For highly complex, multi-layered problems (like patient falls, medication errors, or persistent infection rates), the **Fishbone Diagram** is your comprehensive structural tool. It systematically prevents you from focusing too narrowly on one cause by challenging you to explore all systematic areas that could contribute to the problem.

Figure 8-: Fishbone analysis session

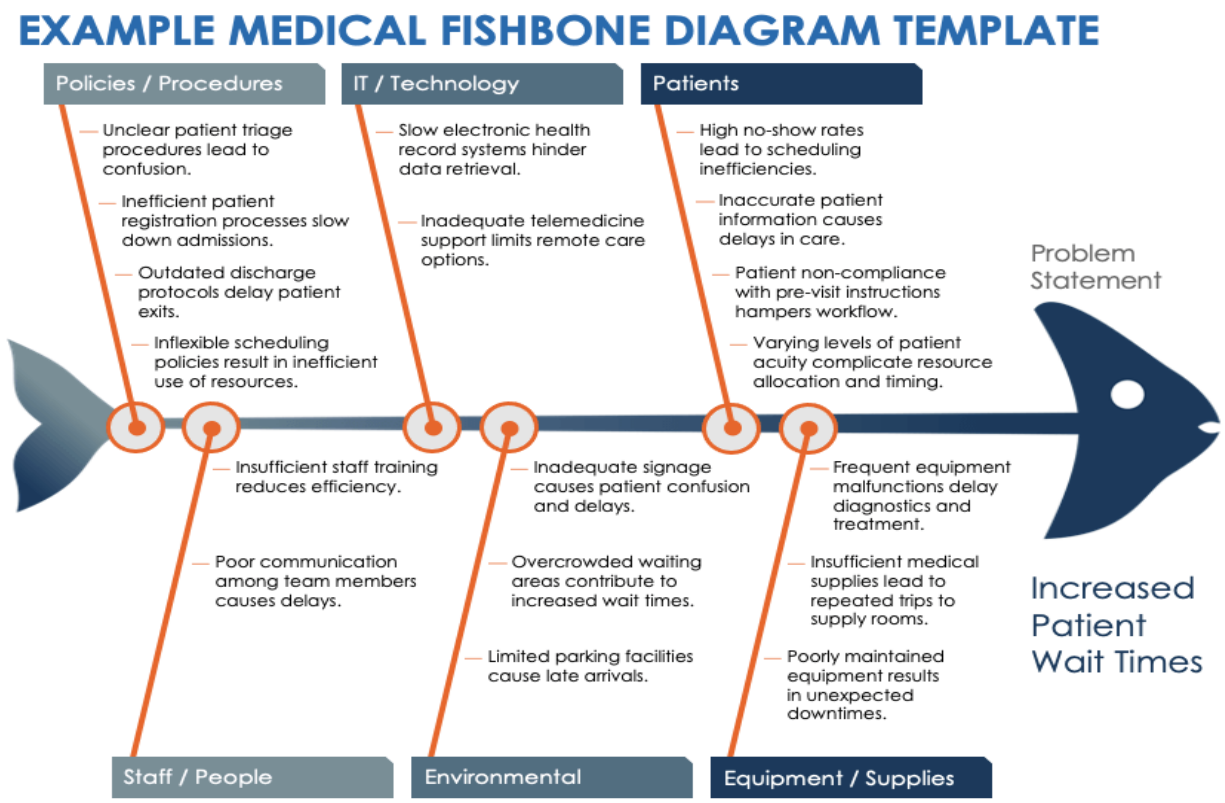


Figure 9: Fishbone analysis image

The 6 Healthcare "M" Categories: These bones ensure a comprehensive and non-judgmental review of every potential systematic cause:

- **Manpower:** Staffing levels, training gaps, competency, fatigue, and team communication issues.
- **Methods:** Policies, procedures, standard operating protocols, and workflows.
- **Machines:** Equipment functionality, technology failures, hardware, and EHR usability/design.
- **Materials:** Supply quality, necessary stock levels, drug availability, and expiry management.
- **Measurement:** Data collection accuracy, audit systems, reliability of metrics reported, and feedback loops.
- **Mother Nature:** Physical environment, lighting, noise, physical space, and facility design.

Example: Lack of a Standard Operating Procedure (SOP) for Recording and Communicating Laboratory Blood Test Results

Description of the defect:

In many PHC facilities, there is no clearly defined or standardized procedure for recording, tracking, and communicating laboratory blood test results. Test results may be received informally through phone calls, handwritten notes, or printed forms placed in files without a structured system for verification, documentation, or timely follow-up.

How the Defect Manifests:

- Laboratory results are misplaced or filed incorrectly because there is no dedicated register or digital tracking system.
- Health care workers are unsure of who is responsible for collecting, recording, or communicating the results to clients.
- Delays occur between when the laboratory releases results and when they are communicated to patients.
- Results that indicate urgent clinical action (e.g., positive HIV results, low haemoglobin levels) are not prioritised for immediate follow-up.

Impact on Service Delivery:

- Delayed clinical decisions: Patients may not receive timely treatment or interventions, leading to poor health outcomes.
- Reduced patient trust and satisfaction: Clients lose confidence in the facility's ability to manage their care efficiently.
- Increased workload: Staff spend extra time searching for or re-requesting lost results.
- Poor continuity of care: When results are missing, subsequent providers may not have complete information to make informed decisions.
- Potential medico-legal risks: Incomplete documentation can lead to accountability and audit challenges.

Underlying Causes (Root Causes):

- Absence of a documented SOP guiding staff on how to handle, record, and communicate laboratory results.
- Inadequate training of staff on record-keeping and data management.
- Limited supervision or quality assurance to ensure compliance with protocols.
- Lack of standardised tools (registers, electronic systems) for result management.

Suggested Corrective Actions:

- Develop and implement a clear SOP for the management of laboratory results.
- Train all clinical and administrative staff on the SOP and their specific roles in the process.
- Introduce a standardized results register or integrate result tracking into the facility's electronic patient management system.
- Conduct regular audits to ensure results are documented, reviewed, and communicated to patients within a set timeframe.
- Assign clear accountability (e.g., designate a results officer or nurse in charge).

Practice Challenge

1. **Task:** Select one significant **waste** or a major recurrent problem from your process map (e.g., mislabelled samples).
2. **Activity:** Work through the **5 Whys** or structure your thinking using the **Fishbone Diagram** until you arrive at a clear, addressable, systemic cause.

PDSA, Low-Risk Experiment Zone

Learning outcomes

By the end of this session, participants should be able to:

- Describe the PDSA cycle and its role in implementing and testing small changes for improvement.
- Plan a PDSA cycle using a clear problem statement, measurable objectives, and defined indicators.
- Implement and monitor small-scale interventions to test their effectiveness.
- Analyse results and make informed decisions to adapt, scale, or revise interventions for continuous improvement.

Concept: Test Small, Learn Fast (The Clinic Garden)

You would never renovate an entire clinic based on a guess. Similarly, we don't fully implement a change until we **test it safely**. The **Plan-Do-Study-Act (PDSA) cycle** is the scientific method applied directly to QI, acting as the engine that drives continuous learning. The mantra is **small scale, rapid cycles**, learn your way to success without massive resource expenditure or patient risk.

The PDSA cycle of improvement is a model for testing a change in the real work setting – by planning, implementing and analysing the results, and acting on what has been learned.

It is an evidence-based, systematic method adapted for action-oriented learning: starting with a plan and ending in an action based on learning gained.

Table 10: PDSA example – Place signage and reduce direction inquiries.

PDSA Phase	Core Goal	Action Example: The Signage Experiment
PLAN	Define the objective, the specific prediction, and the detailed test parameters (who, what, where, when).	**Prediction:** Placing a sign will reduce inquiries by 20% (from 10 to 8). **Test:** Nurse A uses the sign for 2 hours on Tuesday with the first 20 patients.

DO	Execute the plan exactly as written and observe/document issues or deviations during execution.	Nurse A runs the test and notes the question count. She records that patients are not looking at the sign because it is placed behind a potted plant.
STUDY	Analyze the data against the prediction. Summarize precise learning points and unexpected observations.	**Result:** Questions only dropped by 5% (from 10 to 9.5). **Learning:** The sign itself works, but its placement and size (physical environment) obstructed visibility.
ACT	Based on learning, you must formally **Adopt** (standardize), **Adapt** (refine), or **Abandon** the change idea.	**Adapt:** We will move the sign to eye level, use a stronger colour contrast, and test it again with Nurse B on Wednesday for a more robust data point. **New P-D-S-A cycle starts tomorrow.**

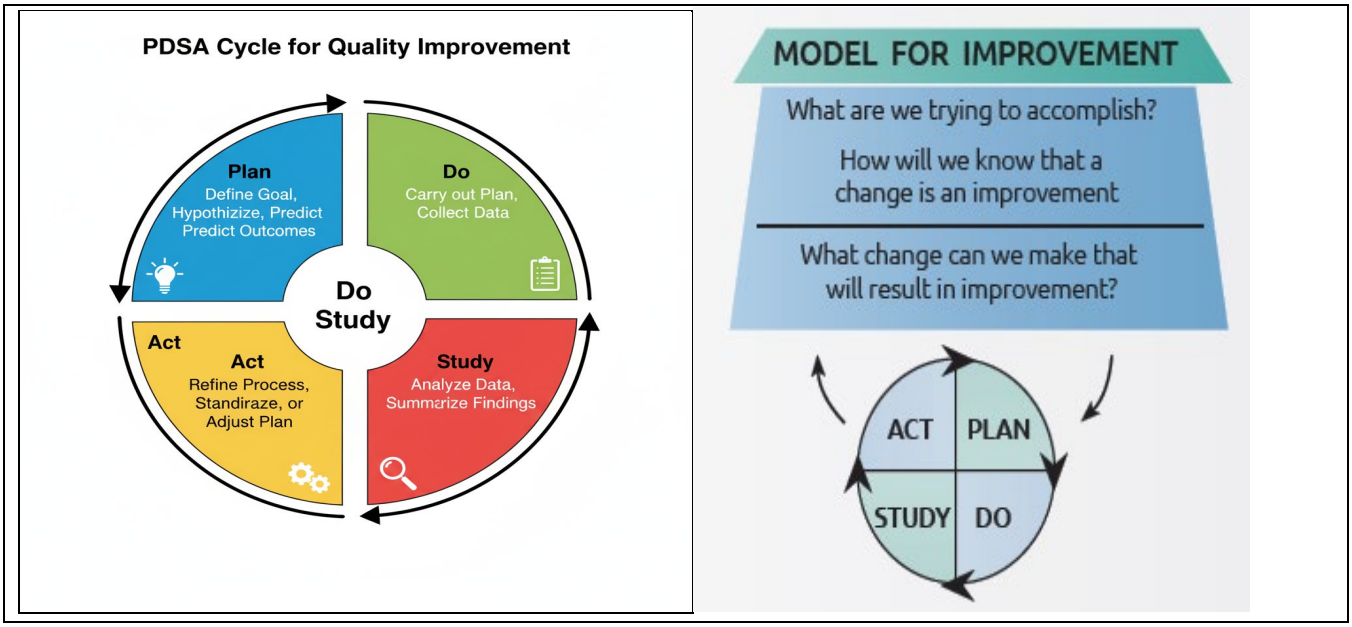


Figure 9: PDSA cycle for quality improvement

There are three critical questions which guide the PDSA cycle of improvement:

- **What are we trying to achieve?**
  Teams should formulate specific targets or aims that they hope to accomplish (what, how much and by when)
- **How will we know when a change is an improvement?**
  Teams use quantitative measures (data) to determine if a specific change actually leads to an improvement (and reaches the target)
- **What change can we make that will result in improvement?**
  This is determined by trying, testing, and using data to assess the results.

Figure 10: PDSA cycle for quality improvement

Scenario: The Coin Spin Game (Group Activity)

1. **Goal:** Increase average coin spin time (a metaphor for maximizing value-add patient time) from 8 seconds to 12 seconds in 3 cycles.
2. **Activity:** Teams run 3 quick PDSA cycles, documenting the **specific change (Adapt)** they make based on the quantifiable data recorded from the previous cycle, illustrating the continuous nature of QI.

M&E and The Communication Story

Quality Improvement Measurement (M&E)

Learning Outcomes

By the end of this session, participants should be able to:

- Explain the role of Monitoring and Evaluation (M&E) in tracking progress of QI initiatives.
- Identify and use relevant QI indicators (process, output, and outcome indicators).
- Collect, analyse, and interpret data to assess the impact of implemented changes.
- Prepare and present progress summaries or dashboards to demonstrate improvement over time.

- Use feedback from M&E data to guide further improvement cycles.

Tracking three measure types provides a critical, balanced QI dashboard. This discipline ensures that your successful fix in one area isn't unintentionally creating a significant operational problem elsewhere in the system.

Table 11: Measuring quality improvement.

Measure Type	What It Tracks	Why It's Essential
Outcome	The **final result**, the desired benefit to the patient or organization (the *What*).	Did we hit the ultimate goal of the QI project? (e.g **Reduction in patient readmission rate** from 10% to 5%).
Process	**Staff compliance**, are we reliably following the new procedure correctly (the *How*).	Are we doing the right thing, and is the new process being executed consistently? (e.g **Percentage of shifts where the new handover checklist was fully completed**).
Balancing	**Unintended consequences**, did we create a new problem elsewhere in the system?	Did the solution introduce harm in an unexpected area, such as staff morale or patient throughput? (e.g **Increase in Nurse Shift Overtime** or patient complaints).

Pro Tip: If your **Outcome** measure improves dramatically, but your **Balancing** measure worsens significantly (e.g., patient safety improves but staff turnover doubles), you have not achieved true, sustainable quality improvement! **Balance is everything.**

Communicating data results

Learning outcomes

By the end of this session, participants should be able to:

- Understand the importance of effective data communication in healthcare decision-making.
- Select appropriate formats (tables, charts, graphs) to present health data clearly and accurately.
- Tailor communication of data results for different audiences (management, colleagues, and community stakeholders).
- Deliver clear, concise, and actionable messages based on data findings to promote informed decisions and continuous quality improvement

The best data is useless if it cannot be communicated effectively. Use the **P.A.C.** framework to transform your results into a short, compelling narrative designed to inspire action from decision-makers.

Table 12: PAC framework of communication.

Formula Element	Focus & Goal	Example: The Handover Story
P, Problem	**Start with Data:** Establish urgency and magnitude using **baseline data** (a Day 3 skill).	Our audit shows **18% of patient medication changes** are missed during shift handover, this is a critical, quantifiable safety risk that must be addressed immediately!
A, Action	**Show Logic:** Describe the **Root Cause** found and the **small PDSA test** you executed.	We used 5 Whys to diagnose the communications gap and tested a simple, 5-step verbal checklist with our evening nursing staff in a focused PDSA cycle.
C, Change	**The Ask:** Present the **new data** (the improvement!) and give a clear, direct **Call to Action**.	Missed changes dropped sharply to 2% during the test period! **My recommendation is to Adopt this checklist immediately and include it as mandatory content in new staff orientation.**

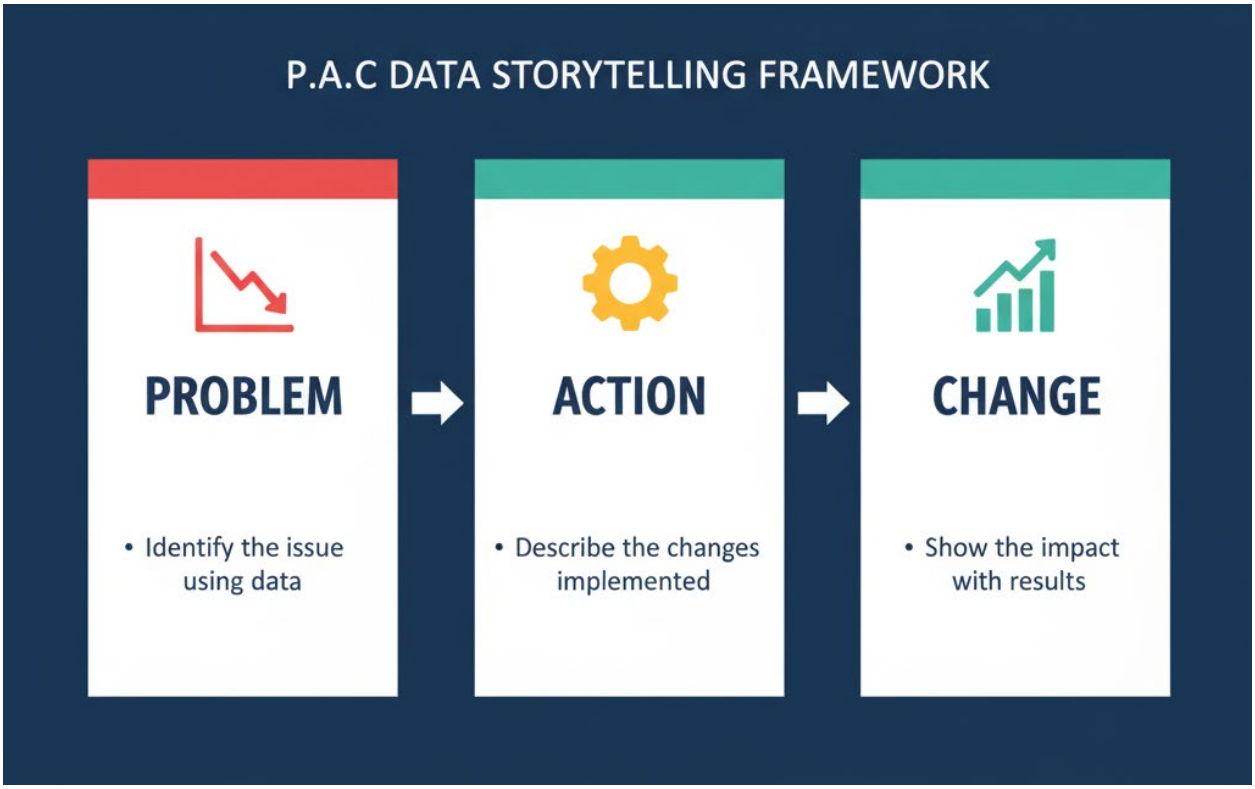


Figure 11: PAC storytelling communication

Role-Play Game: The Persuader Challenge
1. **Task:** In pairs, the **Data Champion** delivers a confident, concise 60-second **P-A-C** pitch to the **Clinic Manager**. 2. **Objective:** The Champion must end with a bold, clear **Ask** that requires a definitive decision or resource allocation. 3. **Vote:** The group votes for the most persuasive pitch, celebrating clarity and the strong, data-driven link between the problem, the test, and the requested action.

Wrap-Up: The Change Agent's Toolkit

- **Focus on processes, not people.** System failure is the enemy; resilience is the goal.
- **Test small, learn faster.** Use PDSA to manage risk and accelerate learning.
- **Measure Outcome + Process + Balance.** Ensure true, holistic, and sustainable improvement.
- **Tell your story with data** using the **P-A-C framework**, inspire action and drive change!

Figure 12: Summary of events

Self-Reflection Questions

- Which **process** in your clinic frustrates you the most? Describe the "waiting" waste you observe most frequently.
- What **single, smallest step** in that process could be the target for your first tiny PDSA test this week?
- What **Outcome Measure** would definitively prove your success, and what **Balancing Measure** would you track to ensure no harm is done?

Figure 11: Reflection

References

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Day 5: Practicum: Mini-Project Development and Presentation

Day Overview

Today is your opportunity to bring together everything you have learned during the past four days. You will apply your digital literacy, data management, quality improvement, and health information systems skills to develop a practical mini-project that addresses a real performance challenge at your facility.

The practicum moves you from learning tools to applying them in a full-cycle improvement initiative.

Session at-a-Glance

Session	Focus	Method	Time
5.1	Overview and guidance on mini-project objectives, content, and preparation	Presentation and discussion	30 min
5.2	Mini-project proposal: the basics (title, problem statement, SMART objective)	Individual work, group discussion, plenary	40 min
5.3	Data collection and analysis planning (sources, methods, KPIs)	Individual work, group discussion, plenary	35 min
5.4	Implementation planning (activities, resources, risks, timeline)	Individual work with Excel template, group discussion	70 min
5.5	Monitoring, evaluation, PowerPoint development, and presentations	Group work, presentations, plenary	60 min

Learning Outcomes

By the end of this practicum, you should be able to:

1. Develop and present a mini-project proposal that addresses a quality improvement performance challenge.
2. Detail the objectives, activities, methods, timelines, roles, and measurable outcomes for your project.
3. Collect, organise, and analyse data to establish a baseline and track improvement.
4. Plan and implement activities that are feasible within your PHC setting.
5. Monitor and evaluate your mini-project using M&E frameworks and indicators.
6. Identify lessons learned and strategies for scaling up successful interventions.

Why This Practicum Matters

Primary Health Care facilities operate in fast-paced and resource-constrained environments. Common service delivery challenges include long waiting times, inconsistent documentation, stock-outs, poor data quality, and gaps in patient follow-up. These challenges directly affect health outcomes.

This practicum gives you a structured, practical approach to address these challenges. Rather than discussing improvement in the abstract, you will work through a complete improvement cycle: identifying a real problem with data, setting a SMART objective, planning an intervention, and preparing to monitor its impact. The skills you practise today are the same skills you will use as a PHC manager to lead meaningful change at your facility.

Preparation Steps

Before you begin your mini-project, complete the following steps:

1. Engage your facility leadership to secure their support for the project.
2. Collect baseline data before starting any interventions.
3. Prepare an implementation calendar with realistic timelines.
4. Identify collaborators and available resources at your facility.
5. Keep evidence such as photos, registers, and meeting minutes.
6. Draft your presentation slides early and update them as you progress.

Session 5.1: Overview and Guidance on Mini-Project Objectives

Session Objective: Understand the purpose, structure, and key components of the mini-project proposal.

Key Components of a Mini-Project Proposal

Your mini-project proposal must include all of the elements described below. Each component plays a specific role in ensuring your project is well-defined, evidence-based, and achievable.

Component	Description
Mini-project name	A short, clear, and descriptive name that summarises the main focus of the project.
Responsible person	The project lead who will organise resources, secure buy-in from staff, and coordinate the project team.
Hard skill(s) to be tested	The specific hard skill(s) from the course that will be applied in the project.
Location	The exact facility name and district where the project will be implemented.
Target audience	The people the project focuses on: internal (staff members) and/or external (patients or service recipients).
Problem statement	A concise description of the health challenge or gap, answering: What is the problem? Who is affected? Why is it important? What data shows the problem exists?
SMART objective(s)	Clear, measurable goals that are Specific, Measurable, Achievable, Relevant, and Time-bound.

> **Example Problem Statement:** *"Only 60% of adult patients have their blood pressure recorded at each visit, increasing the risk of missed hypertension cases."*
>
> **Example SMART Objective:** *"Increase blood pressure recording compliance from 60% to 90% within 3 months."*

Session 5.2: Mini-Project Proposal Preparation — The Basics

Session Objective: Complete the basic elements of your mini-project proposal: title, responsible person, hard skills, location, target audience, problem statement, and SMART objective.

Individual and Group Activity

1. Individual work (10 minutes): Complete the template below with your project details.
2. Small group discussion (10 minutes): In groups of 4–5, share and discuss your individual work.
3. Plenary discussion (20 minutes): Present your work to the full group for feedback.

Your Mini-Project Proposal — Basic Details

Mini-Project Title	
Responsible Person	
Hard Skill(s) Applied	
Facility / Location	
District	
Target Audience	

Problem Statement

Write your problem statement below. Remember to state what the problem is, who is affected, why it is important, and what evidence or data shows that the problem exists.

Your problem statement:

SMART Objective

SMART Element	Your Objective
Specific	

SMART Element	Your Objective
Measurable	
Achievable	
Relevant	
Time-bound	

Full SMART Objective Statement:

Session 5.3: Mini-Project Data Collection and Analysis

Session Objective: Define what data you will collect, where it will come from, how you will analyse it, and how you will know the project was successful.

Types and Sources of Data

Your mini-project may draw on two types of data. Quantitative data includes numbers, percentages, and rates drawn from routine systems. Qualitative data includes observations, staff feedback, and patient experience reports. The table below summarises the main sources you can access.

Data Source Category	Examples
Routine clinical records	Patient files, tick registers, referral forms, HTS registers, TB registers
Electronic health information systems	DHIS, Tier.Net, HPRS
Administrative and operational data	HR records, stock control records, duty rosters
Performance monitoring and QI data	Ideal Clinic data, waiting time surveys, PDSA records

Data Analysis Methods

You will use simple analysis methods appropriate to your project. These include calculating percentages, averages, and trend graphs to show change over time; identifying gaps, bottlenecks, and variations in your data;

comparing current performance against desired performance or targets; and determining root causes using tools such as fishbone diagrams and the 5 Whys technique from Day 4.

Anticipated Results and Key Performance Indicators

Your project must define measurable outputs and outcomes that align with your SMART objective. Your Key Performance Indicators (KPIs) must be clearly defined, measurable, time-bound, and directly linked to your anticipated results.

Example Anticipated Result: *"100% of newly diagnosed hypertensive patients receive blood pressure measurement and lifestyle counselling during clinic visits."*

Example KPI: *"Percentage of hypertensive patients whose blood pressure is controlled (<140/90 mmHg) within six months of enrolment into care."*

Individual and Group Activity

1. Individual work (10 minutes): Complete the template below for your data collection, analysis, results, and KPIs.
2. Small group discussion (10 minutes): Share and discuss in groups of 4–5.
3. Plenary discussion (15 minutes): Discuss common data challenges and how you address them.

Your Data Collection and Analysis Plan

Data to be collected	
Source(s) of data	
Collection method(s)	
Analysis method(s)	
Anticipated results	
Key Performance Indicator(s)	

Session 5.4: Mini-Project Implementation Plan

Session Objective: Produce a detailed implementation plan with activities, resources, responsible persons, risks, mitigation measures, and timeline.

Purpose of an Implementation Plan

An implementation plan translates your SMART objective into concrete action. It clarifies who will do what, by when, and with what resources. It also helps you anticipate risks and plan how to manage them. A well-structured implementation plan supports monitoring and evaluation by making it clear what should be happening at each stage of your project.

> **Individual and Group Activity**
>
> 1. Individual work (40 minutes): Complete an Excel worksheet template covering all three phases below.
> 2. Small group discussion (15 minutes): Share your plan in groups of 4–5.
> 3. Plenary discussion (15 minutes): Present to the full group.

Phase 1: Preparation

Target period: Week 1–2

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Phase 2: Implementation

Target period: Week 2–4

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Phase 3: Reporting

Target period: Week 4

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Session 5.5: Monitoring, Evaluation, and Presentation

Session Objective: Develop a PowerPoint presentation of your mini-project and present it to the group. Understand how to monitor and evaluate the practicum and plan for project sustainability.

Mini-Project PowerPoint Presentation Structure

Your group will develop a PowerPoint presentation that includes the following sections. Use the skills you learned in Day 1 (PowerPoint) and Day 3 (data visualisation) to create clear, professional slides.

Slide Section	Content
Title slide	Project name, responsible person, facility, and date.
Problem statement	What issue you are addressing and what data supports it.
SMART objective	Your measurable improvement goal.
Hard skills applied	Which skills from the course you are using.
Methods	How you will carry out the project (data collection, interventions).
Location of intervention	Where the project will take place.
Description of interventions	The specific actions you will take.
Results	Include data tables and graphics showing baseline and anticipated outcomes.
Challenges and lessons learned	What obstacles you foresee and what you have learned from the planning process.

Group Activity

1. Presentation development (30 minutes): In groups, develop your PowerPoint presentation following the structure above.

2. Presentations (30 minutes): Present your mini-project to the full group. Each group has approximately 5 minutes to present, followed by questions and feedback.

Sustainability Planning

A successful mini-project does not end when the training is over. You need to plan how the improvements will continue after the practicum. Consider the following questions and write your responses below.

How will you maintain the changes introduced by your project?

Who will take over responsibility for the project after the training?

What resources will be needed to sustain the improvement?

How will you train other staff members to continue the work?

Summary Checklist

Before the end of Day 5, ensure you have completed all of the following. Use this checklist to confirm your mini-project is ready.

- ☐ Mini-project name and responsible person identified
- ☐ Problem statement written with supporting data
- ☐ SMART objective defined (Specific, Measurable, Achievable, Relevant, Time-bound)
- ☐ Hard skills to be applied listed
- ☐ Data sources and collection methods identified
- ☐ Data analysis methods defined
- ☐ Anticipated results and KPIs set
- ☐ Implementation plan with activities, resources, roles, risks, and timeline completed
- ☐ PowerPoint presentation developed and delivered
- ☐ Sustainability plan drafted

Celebrate Your Achievement

You have completed a five-day journey in which you have learned and shared your health service delivery experiences and realities. You have built hard skills in digital literacy, data management, health information systems, and quality improvement. The skills you have developed today will help you lead meaningful improvements at your facility.

Our Promise: Healthy living for all.

Templates & Worksheets

Complete these templates as directed by the facilitator during the training sessions.

Data Interpretation Worksheet (Day 3)

Field	Details
Participant Name(s)	
Facility / District	
Date	
Data Source Used	

Step 1: Describe the Data

Question	Your Response
What indicator are you looking at?	
What time period?	
Key numbers / values?	
Target or benchmark?	

Step 2: Analyse the Trend

Question	Your Response
Improving, declining, or stable?	
Compared to target?	
Compared to previous periods?	

Step 3: Interpret

Question	Your Response
What might explain this?	
Who is most affected?	
Data quality issue or real gap?	
What additional info needed?	

Step 4: Act

Question	Your Response
Priority management concern?	

Action for next month?	
Draft SMART target:	

Step 5: Communicate

Summary Statement

Change Idea Template (Day 4)

Element	Your Response
Change Idea (Title)	
Root Cause Addressed	
What will be done?	
Who will do it?	
When will it start?	
Where?	
How?	
How often?	
Expected Outcome	

PDSA Cycle Worksheet (Day 4)

Field	Details
PDSA Cycle Number	
Change Idea Being Tested	
Aim Statement	
Date	

PLAN

DO

STUDY

ACT

Mini-Project Proposal Template (Day 5)

Field	Details
Mini-Project Title	
Responsible Person	
Facility / Location	
Target Audience	
Hard Skill(s) Applied	
Date	
Mentor / Supervisor	

Problem Statement

What is the issue? What data supports this? Why does it matter?

SMART Objective

SMART Element	Your Objective
Specific	
Measurable	
Achievable	
Relevant	
Time-bound	

Full SMART Objective Statement

Implementation Plan Template (Day 5)

Field	Details
Project Title	
Responsible Person	
Project Period	

Phase 1: Preparation

Target period: Week 1–2

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Phase 2: Implementation

Target period: Week 2–4

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Phase 3: Reporting

Target period: Week 4

Activity	Responsible	Timeline	Resources	Risk / Mitigation

Gemba Walk Observation Form (Day 4)

Field	Details
Facility Name	
Area / Process Observed	
Date	
Observer(s)	
Purpose of Walk	

1. Patient Flow	Yes	No	Notes
Patient journey visible			
Waiting areas functional			
Bottlenecks identified			
Clear signage			

2. Work Processes	Yes	No	Notes
Roles clear			
SOPs followed			
Tasks in sequence			
Staff can explain process			

3. Tools & Supplies	Yes	No	Notes
Equipment available			
Supplies at point of use			
No stock-outs			
No expired items			

4. Documentation	Yes	No	Notes
Files retrievable			
Registers complete			
Data aligns with source			
No duplication			

5. Environment & Safety	Yes	No	Notes
Clean and orderly			
Infection prevention			
Waste segregation			
Patient privacy			

6. Communication	Yes	No	Notes
Effective staff communication			
Clear handovers			
Patients get instructions			
Teamwork observed			

Improvement & Action Summary

Key Problems Identified

Likely Root Causes

Change Idea for PDSA Testing