

Exercise 6 – Creating and Editing GIS Data

Objectives: As the title suggests, you will be creating and editing table data in a Geographic Information System; specifically you will learn about:

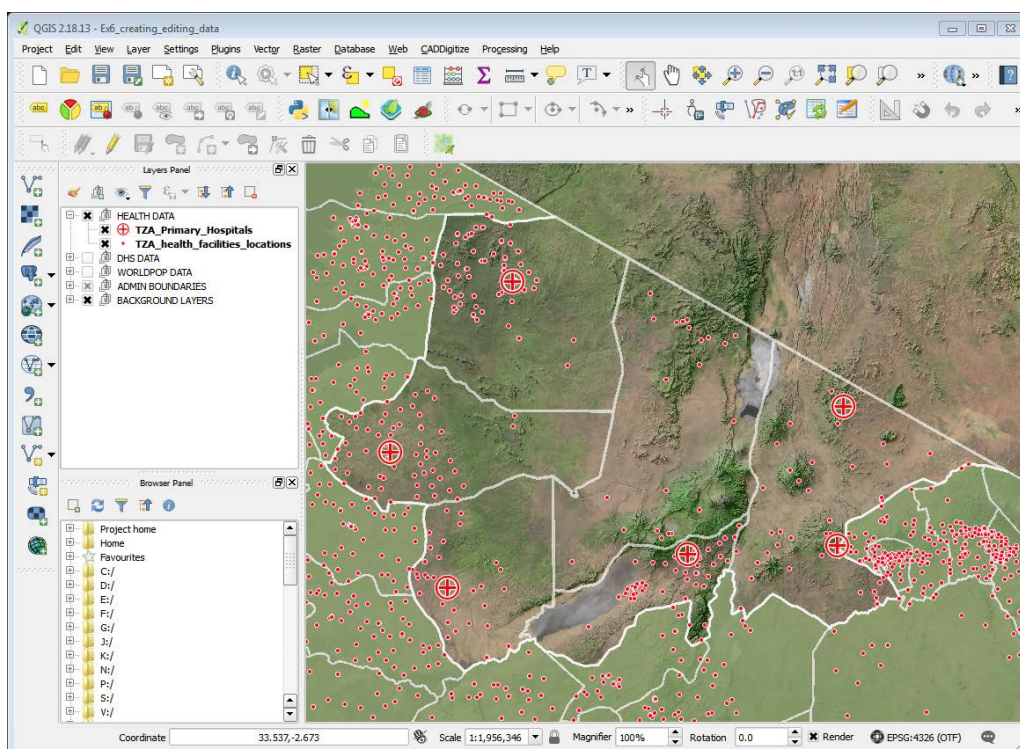
- Starting a data editing session (toggle editing)
- Creating new table fields
- Specifying data types (text fields, number fields etc.)

Scenario: you are a planner for the Tanzania Ministry for Health and Social Welfare. You are helping to build a spatial database of Health services in order to analyse current service provision, usage and access. It is hoped that such a database will help to determine current and future demands, and to address deficiencies. You will be presented with some sample training data which is intended to address the learning points above. *Please note, the data is illustrative and should not be taken as authoritative. Please ask if there is anything you don't understand!*

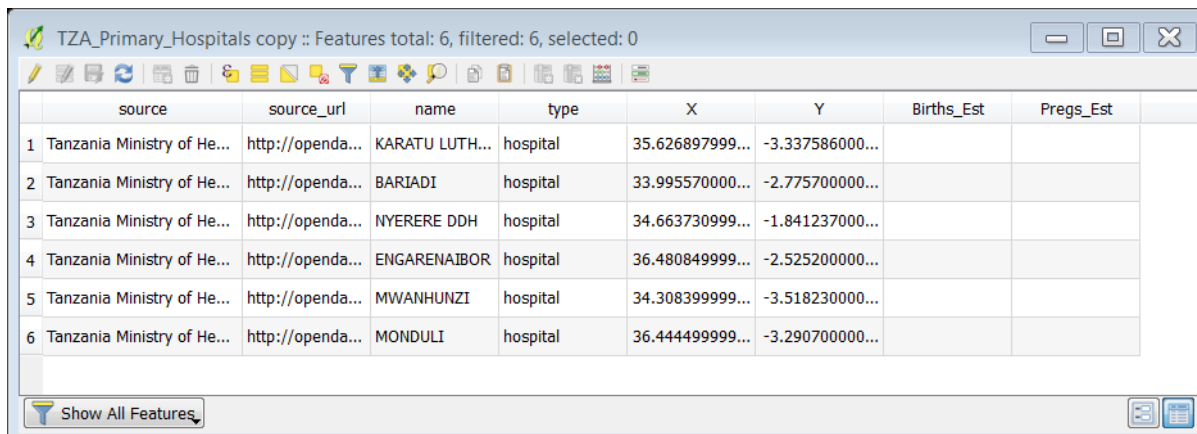
Part 1 – Create new attribute table data in QGIS

On opening the following QGIS project you will be presented with two layers of point locations, 1) all health facility locations in Tanzania and 2) the locations of six primary hospitals in six districts of northern Tanzania, close to the border with Kenya. We are going to attribute these six hospitals with data on births, pregnancies, infant and under-five mortality and HIV prevalence.

- First, double-click to open the following QGIS project document
C:\Intro_Quantum_GIS\Exercises\Exercise_6.qgs



- In the **Layers Panel**, right-click *TZA_Primary_Hospitals* and select **Open Attribute Table**



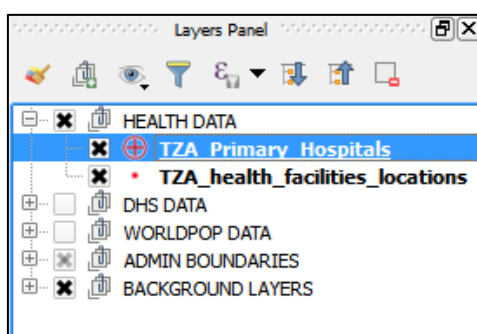
	source	source_url	name	type	X	Y	Births_Est	Pregs_Est
1	Tanzania Ministry of He...	http://openda...	KARATU LUTH...	hospital	35.626897999...	-3.337586000...		
2	Tanzania Ministry of He...	http://openda...	BARJADI	hospital	33.995570000...	-2.775700000...		
3	Tanzania Ministry of He...	http://openda...	NYERERE DDH	hospital	34.663730999...	-1.841237000...		
4	Tanzania Ministry of He...	http://openda...	ENGARENAIBOR	hospital	36.480849999...	-2.525200000...		
5	Tanzania Ministry of He...	http://openda...	MWANHUNZI	hospital	34.308399999...	-3.518230000...		
6	Tanzania Ministry of He...	http://openda...	MONDULI	hospital	36.444499999...	-3.290700000...		

Each row in the table relates to one of the six hospitals. Select each row to see its location on the map canvas. We are going to fill in this table with some data that has been collated on births and pregnancies in the region. Let's locate the data:

- In Windows Explorer navigate to the following file and open it in **Excel** or another programme: *C:\Intro_Quantum_GIS\Exercises\Data\Tables\TZA_HealthData.csv*

Study the table, the fields *Births_sum* and *Pregs_sum* represent an estimate of births and pregnancies respectively, within a catchment area of 30km from each primary hospital for the year 2015 (*calculated from WorldPop data on Births/Pregnancies, see Worldpop.org*). We will copy these data to the dataset *TZA_Primary_Hospitals*. In order to do that, it is necessary to start an *editing session* in QGIS, known as *Toggle Editing*.

- Firstly, in the **Layers Panel**, click *TZA_Primary_Hospitals* to make it the active layer



- Now locate the **Digitizing Toolbar** as shown below (note, if it is not currently visible, you will need to select it in the **View** drop-down menu (**View > Toolbars > Digitizing Toolbar**))
- Click **Toggle Editing**



- Now return to the attribute table for *TZA_Primary_Hospitals* and fill in the missing data values for *Births_Est* and *Pregs_Est* with reference to the data table *TZA_HealthData.csv*; the first record is shown below:

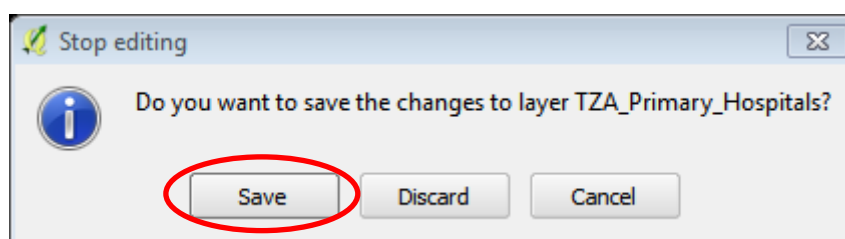
TZA_Primary_Hospitals :: Features total: 6, filtered: 6, selected: 0

abc source = £ Update All Update Selected

	source	source_url	name	type	X	Y	Births_Est	Pregs_Est
1	Tanzania Ministry of Health and So...	http://opendata....	KARATU LUTHERAN	hospital	35.62689799999...	-3.33758600000...	8482	12012
2	Tanzania Ministry of Health and So...	http://opendata....	BARIADI	hospital	33.99557000000...	-2.77570000000...	NULL	NULL
3	Tanzania Ministry of Health and So...	http://opendata....	NYERERE DDH	hospital	34.66373099999...	-1.84123700000...	NULL	NULL
4	Tanzania Ministry of Health and So...	http://opendata....	ENGARENAIBOR	hospital	36.48084999999...	-2.52520000000...	NULL	NULL
5	Tanzania Ministry of Health and So...	http://opendata....	MWANHUNZI	hospital	34.30839999999...	-3.51823000000...	NULL	NULL
6	Tanzania Ministry of Health and So...	http://opendata....	MONDULI	hospital	36.44449999999...	-3.29070000000...	NULL	NULL

Show All Features

- Once all of the births and pregnancy data has been filled in click **Toggle Editing** again
- When prompted, click **Save** to accept the changes
-



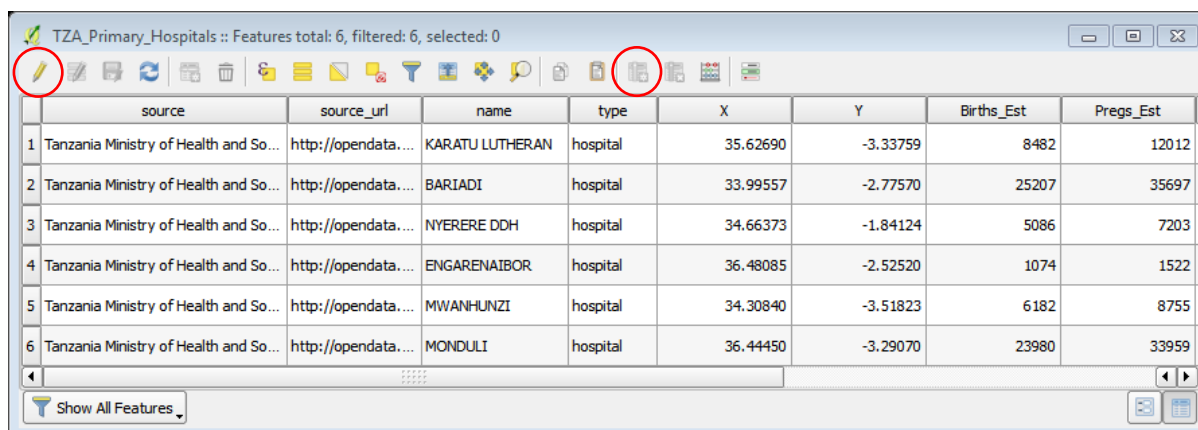
Part 2 – Create new table fields and populate with data values

Returning to the table *TZA_HealthData.csv*, you will notice there are four additional fields of data relating to our six hospitals. The data are described below (*source: DHS, dhsprogram.com*). Note that these are regional values, relating to the DHS region within which each hospital is located.

QGIS field header:	Alias:	Definition:
IMR	Infant mortality rate	Probability of dying before the first birthday (in the ten years preceding the survey [five years for Total]) per 1,000 live births
U5MR	Under-five mortality rate	Probability of dying before the fifth birthday (in the ten years preceding the survey [five years for Total]) per 1,000 live births
HIV_PrevM	HIV prevalence among men	Percentage HIV positive among adult men who were tested. Data are shown with lower and upper bounds of the confidence intervals showing the range of the estimate with 95% probability. Starting around 2015 The DHS Program changed the HIV testing algorithm to add a confirmatory test for all EIA positive specimens. This change may affect trends in HIV prevalence estimates in some countries.
HIV_PrevF	HIV prevalence among women	Percentage HIV positive among adult women who were tested. Data are shown with lower and upper bounds of the confidence intervals showing the range of the estimate with 95% probability. Starting around 2015 The DHS Program changed the HIV testing algorithm to add a confirmatory test for all EIA positive specimens. This change may affect trends in HIV prevalence estimates in some countries.

We will now create four additional fields in our *TZA_Primary_Hospitals* dataset to accommodate these data.

- Open the attribute table for *TZA_Primary_Hospitals*

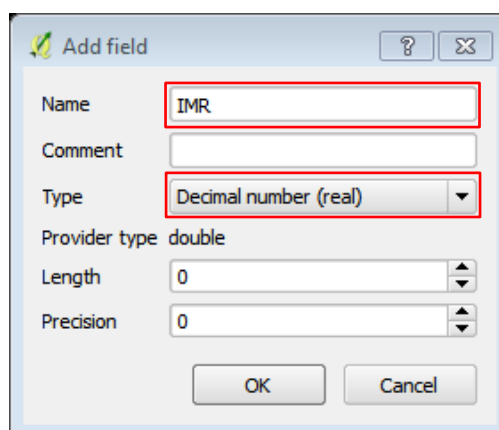


TZA_Primary_Hospitals :: Features total: 6, filtered: 6, selected: 0

	source	source_url	name	type	X	Y	Births_Est	Pregs_Est
1	Tanzania Ministry of Health and So...	http://opendata....	KARATU LUTHERAN	hospital	35.62690	-3.33759	8482	12012
2	Tanzania Ministry of Health and So...	http://opendata....	BARIADI	hospital	33.99557	-2.77570	25207	35697
3	Tanzania Ministry of Health and So...	http://opendata....	NYERERE DDH	hospital	34.66373	-1.84124	5086	7203
4	Tanzania Ministry of Health and So...	http://opendata....	ENGARENAIBOR	hospital	36.48085	-2.52520	1074	1522
5	Tanzania Ministry of Health and So...	http://opendata....	MWANHUNZI	hospital	34.30840	-3.51823	6182	8755
6	Tanzania Ministry of Health and So...	http://opendata....	MONDULI	hospital	36.44450	-3.29070	23980	33959

Show All Features

- Click **Toggle Editing**
- Then click **New Field**, as indicated
- In the dialog box that appears, fill in the details as below:



Add field

Name: IMR

Comment:

Type: Decimal number (real)

Provider type: double

Length: 0

Precision: 0

OK Cancel

The only details you need enter are the name of the new field and type (type relates to the type of data to be held in the new field, which in this case is *Decimal numbers*).

- Now repeat the process for the remaining fields U5MR, HIV_PrevM and HIV_PrevF
- Your table is now ready to receive new data; fill in the new fields with the data held in the table *TZA_HealthData.csv* (toggle editing should currently be on but if not, click the pencil icon – if you need a reminder of the process return to page 3)
- When you have filled in all the data, toggle editing and save the changes

You have now built a spatial dataset that could form part of a larger spatial database of health services. As you may realise by now, the processes demonstrated here are just one way of creating new data in a GIS environment.

Challenge

Now that you have spatial data on births, pregnancies, infant/under-fives mortality and HIV, see if you can symbolise the *TZA_Primary_Hospitals* layer to display variations in these attributes between the six hospitals. There are many style options available to you so experiment with them.

Can you work out how to achieve the following style which displays estimates for births in 2015, within a 30km radius of each hospital?

