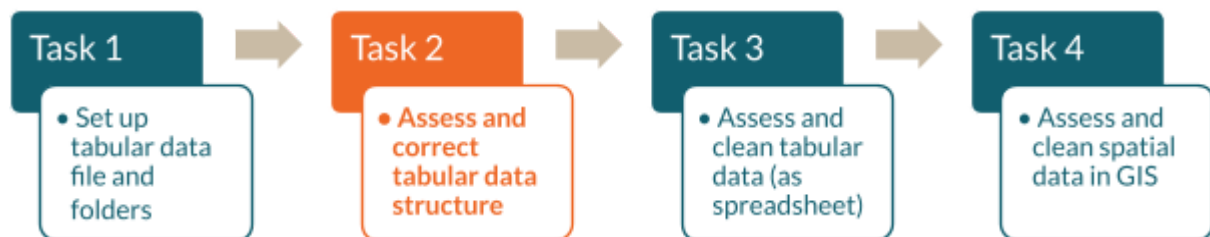


GIS DATA PREPARATION AND MANAGEMENT

Practical Task 2: Editing tabular data structure to enable GIS data import

Task description

This is the second of four tasks in this “data preparation and cleaning” workflow. In the previous task, you set up your data file and folders, as well as started your metadata record. In this task, you will look at the tabular structure itself—the rows, columns, and orientation of the data—and address any problems you find.



Tabular data can only be imported to a GIS if it conforms to several strict requirements relating to data structure. This practical exercise will guide you through the most critical requirements most often encountered by GIS users—these are also listed in the next section. You will be instructed on how to identify these issues and how to adjust your data to meet the requirements.

Data rules covered in this task

- Note any problems you spot in this initial review.
- Data attributed to each feature in **your table should be organised by rows**, not columns.
- **Merged cells cannot be imported** into GIS.
- **Field (i.e. column) headers** should not contain more than 10 characters, nor any spaces or unusual characters.
- GIS will only import **one worksheet at a time**. If your data are distributed across multiple worksheets, you must combine them into one or import them one at a time.



Part 2: Convert column-oriented data to row-oriented data

The second worksheet is organized as shown in the image in exercise 2 below. The data for Dawakin Kudu is complete. However, unlike the other LGAs, it is oriented such that information on each health facility is organized vertically into columns and not into rows as it should.

This situation is typically caused by the data export function of particular health management systems. It can be easily rectified by using the **Transpose** tool in Excel (or your equivalent table-editing software).

Exercise 2

In this exercise, you will follow a series of steps to learn how to convert the orientation of your worksheet from columns to rows.

Step1: Complete the following:

1. Note any problems you spot in this initial review
2. Rename the worksheet *Dawakin Kudu_ORIGINAL*
3. Create a new blank worksheet
4. Rename the new worksheet *Dawakin Kudu*

	A	B	C	D	E	F	G	H	I
1	uniq_id	13028	34627	34646	34656	34657	35090	35092	35103
2	timestamp	15/11/2019	15/11/2019	06/12/2019	15/11/2019	18/12/2018	15/11/2019	15/11/2019	15/11/2019
3	latitude	11.83572	11.67038329	11.7745	11.83932857	11.89984681	11.85481215	11.84732263	11.86952098
4	longitude	8.59633	8.677507377	8.76256	8.595583049	8.663469086	8.529118942	8.530283841	8.536781725
5	wardname	Dawaki	Dabar Kwari	Dosan	Dawaki	Yargaya	Tanburawa	Tanburawa	Tanburawa
6	wardcode	KN0903	KN0901	KN0905	KN0903	KN0914	KN0909	KN0909	KN0909
7	lganame	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu	Dawakin Kudu
8	lgacode	20022	20022	20022	20022	20022	20022	20022	20022
9	statename	Kano	Kano	kano	Kano	Kano	Kano	Kano	Kano
10	statecode	KN	KN	KN	KN	KN	KN	KN	KN
11	updated_on	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	01/03/2019	01/03/2019	01/03/2019
12	func_stats	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional
13	category	Primary Health Center	Dispensary	Dispensary	Primary Health Center	Primary Health Center	Dispensary	Dispensary	Dispensary
	ownership	Private	National Primary Healthcare Development Agency	Others	National Primary Healthcare Development Agency	National Primary Healthcare Development Agency	National Primary Healthcare Development Agency	National Primary Healthcare Development Agency	National Primary Healthcare Development Agency
14	type	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
15	source	Measles Campaign	eHA Polio	eHA Polio	Measles Campaign	Measles Campaign	eHA Polio	eHA Polio	eHA Polio
16	prmry_name	Dawaki Health Center	Fanido Health Post	Kamagata Dispensary	Jido Primary Health Center	Rinji Primary Health Center	Matage Health Post	Gada Health Post	Tamburawa Health Post
		Dawakin Tofa	Dawakin Kudu	Gabasawa	Gezawa	Kumbotso	Nassarawa	Tarauni	Ungogo
								Metadata	+

Step 2: To save time and to keep your workbook in alignment, it is good practice to copy and paste the column widths before copying the actual data.

1. Select and copy any one of the rows from a correct worksheet (such as *Gabasawa*)
2. Now return to your new blank worksheet and click:
 - a. **Paste > Paste special > Paste column widths**



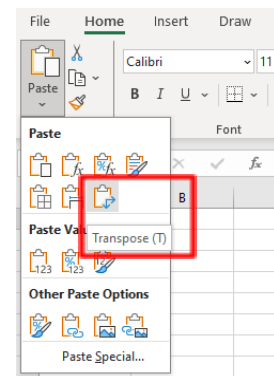
Step 3: You are now ready to transpose your column-oriented data into your prepared worksheet.

1. Return to *Dawakin Kudu_ORIGINAL* worksheet
2. Zoom out in order to see all of the data (i.e. from cell A1 to AC 17), then click and drag across all cells to **select** and then **copy** all of the data

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA	AB	AC	AD
unqid	13028	34627	34646	34656	34657	35090	35090	35090	35028	35071	35209	35206	35208	35208	35208	35218	35218	35228	35244	35466	35472	35564	35568	35574	35576	35582	35728	35680		
timestamp	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019	15/11/2019		
latitude	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	11.83572	
longitude	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	8.59633	
wardname	Dawaki	Dabar Kwar	Dosan	Dawaki	Yargaya	Tanburawa	Tanburawa	Tanburawa	Gurjiya	Dawaki	Yankatsari	Yargaya	Dosan	Zogarawa	Dabar Kwar	Gano	Dosan	Dosan	Dawaki	Ungwar	Duniba	Dabagana	Dawaki	Yankatsari	Tsakuwa	Dawaki	Gano	Jido	Yan Barau	Tsakuwa
wardcode	KNO903	KNO901	KNO905	KNO903	KNO909	KNO909	KNO909	KNO909	KNO907	KNO903	KNO903	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905	KNO905
lganame	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin	Dawakin
lgacode	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	20022	
statastus	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN	KN
updated	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	2019/03/01	
func_stat	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional	Functional
category	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
ownership	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private	Private
lganame	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
source	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary
me	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary	Primary

3. Go to the new worksheet and place your cursor in the top-left cell
4. Use the following command to convert column-oriented data to row-oriented:

Paste > Transpose



Step 3: The data for this LGA should now be correctly oriented. You should finish by tidying the workbook.

1. Delete the worksheet *Dawakin Kudu_ORIGINAL*
2. Move your new worksheet, *Dawakin Kudu*, into the original position for that LGA
3. Remember to **Save** your Excel file

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	unqid	timestamp	latitude	longitude	wardname	wardcode	lganame	lgacode	statastus	statecode	updated_on	func_stat	category	ownership
2	13028	15/11/2019	11.83572	8.59633	Dawaki	KNO903	Dawakin Kudu	20022	Kano	KN	2019/03/01	Functional	Primary Health Center	Private
3	34627	15/11/2019	11.67038329	8.677507377	Dabar Kwar	KNO901	Dawakin Kudu	20022	Kano	KN	2019/03/01	Functional	Dispensary	National Primary Healthcare Development Agency
4	34646	06/12/2019	11.7745	8.76256	Dosan	KNO905	Dawakin Kudu	20022	kano	KN	2019/03/01	Functional	Dispensary	Others
5	34656	15/11/2019	11.83932857	8.595583049	Dawaki	KNO903	Dawakin Kudu	20022	Kano	KN	2019/03/01	Functional	Primary Health Center	National Primary Healthcare Development Agency
6	34657	18/12/2018	11.89984681	8.663469086	Yargaya	KNO914	Dawakin Kudu	20022	Kano	KN	2019/03/01	Functional	Primary Health Center	National Primary Healthcare Development Agency
7	35090	15/11/2019	11.85481215	8.529118942	Tanburawa	KNO909	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
8	35092	15/11/2019	11.84732263	8.530283841	Tanburawa	KNO909	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
9	35103	15/11/2019	11.86952098	8.536781725	Tanburawa	KNO909	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
10	35126	15/11/2019	11.88195982	8.552826668	Gurjiya	KNO907	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
11	35171	15/11/2019	11.842823	8.598307	Dawaki	KNO903	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	Private
12	35181	15/11/2019	11.90924779	8.616618305	Yankatsari	KNO913	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
13	35203	15/11/2019	11.89884244	8.663032102	Yargaya	KNO914	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
14	35206	15/11/2019	11.77507256	8.674129116	Dosan	KNO905	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
15	35208	15/11/2019	11.87898492	8.681853087	Zogarawa	KNO915	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
16	35211	15/11/2019	11.71722127	8.68465928	Dabar Kwar	KNO901	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
17	35218	15/11/2019	11.817365	8.696325	Gano	KNO906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
18	35228	15/11/2019	11.77968815	8.721780305	Dosan	KNO905	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
19	35246	15/11/2019	11.77229633	8.763639536	Dosan	KNO905	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
20	35466	15/11/2019	11.877842	8.628317	Ungwar	KNO911	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
21	35472	15/11/2019	11.80734616	8.79910493	Danbagna	KNO902	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
22	35563	15/11/2019	11.839982	8.601726	Dawaki	KNO903	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	General Hospital	Federal Ministry of Health
23	35566	15/11/2019	11.89596499	8.620570334	Yankatsari	KNO913	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
24	35568	18/12/2018	11.79799443	8.642285753	Tsakuwa	KNO910	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
25	35574	15/11/2019	11.864045	8.70367	Dawakiji	KNO904	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
26	35576	15/11/2019	11.83621484	8.730740535	Gano	KNO906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
27	35692	15/11/2019	11.91278798	8.64879916	Jido	KNO908	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
28	35729	15/11/2019	11.80588337	8.601961348	Yan Barau	KNO912	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency
29	35840	15/11/2019	11.81077713	8.614745845	Tsakuwa	KNO910	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency
30														
31														
32														
33														
34														

Part 3: Identify and correct problems with table rows and columns

As you continue your exploration of the worksheets, we'll look at identifying and correcting common formatting errors with tables and rows.

Exercise 3

Examine the *Gezawa* worksheet (pictured below), and see if you can identify the multiple table formatting issues.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1														
2	Gazewa LGA primary, secondary, and tertiary health care facility points and names.													
3		uniq_id	timestamp	latitude (*DD)	and longitude (*DD)	wardname	wardcode	lganame	lgacode	statename	statecode	updated_on	Functional status	category
4		8347	18/12/2018	12.05	8.74	Ketawa	KN1705	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center
5		13160	15/11/2019	11.98907471	8.76550293	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
6		13184	15/11/2019	12.012756	8.749386	Gawo	KN1702	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
7		13219	15/11/2019	11.992912	8.81153	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
8		31486	15/11/2019	12.020503	8.712401	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center
9		34664	15/11/2019	12.04364537	8.789695127	Wangara	KN1710	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center
10		34665	15/11/2019	11.983936	8.623301392	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center
11		34700	15/11/2019	12.07749952	8.67773316	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
12		35185	15/11/2019	12.016541	8.628572	Babawa	KN1701	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
13		35195	15/11/2019	12.13275242	8.649587725	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
14		35200	15/11/2019	12.08974696	8.654898725	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
15		35201	15/11/2019	12.0330917	8.661591478	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
16		35205	15/11/2019	12.026	8.673354	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
17		35212	15/11/2019	12.093431	8.685254	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
18		35219	15/11/2019	12.026284	8.698632	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
19		35220	15/11/2019	12.05278311	8.701261377	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
20		35222	15/11/2019	12.080634	8.714985	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
21		35233	15/11/2019	11.985135	8.73479	Gawo	KN1702	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
22		35236	15/11/2019	12.145325	8.741825	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
23		35239	15/11/2019	12.068394	8.750792	Ketawa	KN1705	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
24		35240	15/11/2019	12.100511	8.751073	Gezawa	KN1703	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
25		35244	15/11/2019	12.096271	8.754657	Gezawa	KN1703	Gezawa	20010	Kano	KN	01/03/2019	Functional	Maternity Home
26		35247	15/11/2019	11.991586	8.764332	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary
27		35469	15/11/2019	12.037219	8.763453	Wangara	KN1710	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center
28		35571	15/11/2019	12.05799851	8.66027597	Babawa	KN1701		20010	Kano	KN	01/03/2019	Functional	Primary Health Center
29		35572	15/11/2019	11.993569	8.662101	Tsamiya Babba	KN1708		20010	Kano	KN	01/03/2019	Functional	Primary Health Center
30		35598	15/11/2019	12.116114	8.730628	Mesar Tudu	KN1706		20010	Kano	KN	01/03/2019	Functional	Primary Health Center
31		35624	15/11/2019	12.019875	8.747844	Gawo	KN1702		20010	Kano	KN	01/03/2019	Functional	Primary Health Center
32		35625	15/11/2019	12.088102	8.751995	Ketawa	KN1705		20010	Kano	KN	01/03/2019	Functional	General Hospital
33		35730	15/11/2019	11.9834863	8.621238087	Tsamiya Babba	KN1708		20010	Kano	KN	01/03/2019	Functional	Dispensary
34		35734	15/11/2019	12.123433	8.721703	Mesar Tudu	KN1706		20010	Kano	KN	01/03/2019	Functional	Dispensary
35														
		Dawakin Tofa	Dawakin Kudu	Gabasawa	Gezawa	Kumbotso	Nassarawa	Tarauni	Ungogo					

We've listed the formatting errors you may have found in the above table, and have provided solutions to fix these issues:

- Redundant column (A) and row 1 and 2 containing merged cells and a text title
 - **Apply correction:** delete redundant row and column
- Column headers for columns E and F have been merged. They also include spaces between words and unusual characters, such as brackets () and the degree symbol °
 - **Apply correction:** unmerge cells; remove spaces and unusual characters
- The column header *Functional status* is too long (more than 10 characters) and contains extra space between words
 - **Apply correction:** rename header to *func_stats*

Note that the data contained a range of cells highlighted in yellow. Excel cell formatting like this will not be maintained on export to CSV; therefore, unless it serves a continuing purpose in the Excel file, good practice suggests resetting all such cell formatting.



Your corrected worksheet should look as follows:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
	unqid	timestamp	latitude	longitude	wardname	wardcode	lganame	lgacode	statename	statecode	updated_on	func_stats	category	ownership	type	source	primary_name
2	6347	18/12/2018	12.05	8.74	Ketawa	KN1705	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	State Primary Healthcare Development Agency	Primary	eHA Polio	Danja Primary Health Care
3	13160	15/11/2019	11.98907471	8.7655029	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	State Primary Healthcare Development Agency	Primary	eHA Polio	Musko Health Post
4	13184	15/11/2019	12.012756	8.749386	Gawo	KN1702	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	State Primary Healthcare Development Agency	Primary	eHA Polio	Tofa Health Post
5	13219	15/11/2019	11.992912	8.81153	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	State Primary Healthcare Development Agency	Primary	eHA Polio	Tumbau Health Post
6	31486	15/11/2019	12.020503	8.712401	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	Private	Primary	eHA Polio	Nana Nusbai Clinic
7	34664	15/11/2019	12.04364537	8.7896951	Wangara	KN1710	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	Measles Campaign	Sararin Gezawa Health Center
8	34665	15/11/2019	11.983936	8.6233014	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	Measles Campaign	Makera Basic Health Center
9	34700	15/11/2019	12.07749552	8.6777332	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Dambal Health Post
10	35185	15/11/2019	12.016541	8.628572	Babawa	KN1701	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Gunduwa Health Post
11	35195	15/11/2019	12.13275242	8.6495877	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Baita Health Post
12	35200	15/11/2019	12.08974696	8.6548987	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Dan Madanhs Health Post
13	35201	15/11/2019	12.0330917	8.6615915	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Kwasangwami Health Post
14	35205	15/11/2019	12.026	8.673354	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Danzaki Health Post
15	35212	15/11/2019	12.093431	8.685254	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Zango Health Post
16	35219	15/11/2019	12.026284	8.698632	Jogana	KN1704	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Jogana Health Post
17	35220	15/11/2019	12.05278311	8.7012614	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Daradau Health Post
18	35222	15/11/2019	12.080634	8.714985	Zango	KN1711	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Tsalle Health Post
19	35233	15/11/2019	11.985135	8.73479	Gawo	KN1702	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Yafata Health Post
20	35236	15/11/2019	12.145325	8.741825	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Mesar Burmi Health Post
21	35239	15/11/2019	12.068394	8.750792	Ketawa	KN1705	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Ketawa Health Post
22	35240	15/11/2019	12.100511	8.751073	Gezawa	KN1703	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Gezawa Health Post
23	35244	15/11/2019	12.096271	8.754657	Gezawa	KN1703	Gezawa	20010	Kano	KN	01/03/2019	Functional	Maternity Home	Private	Primary	eHA Polio	Bethel Nursing and Maternity
24	35247	15/11/2019	11.991586	8.764332	Tumbau	KN1709	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Musku Health Post
25	35469	15/11/2019	12.037219	8.763453	Wangara	KN1710	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	eHA Polio	Wangara Basic Health Center
26	35571	15/11/2019	12.0579851	8.660276	Babawa	KN1701	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	eHA Polio	Abasawa Basic Health Center
27	35572	15/11/2019	11.993569	8.662101	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	eHA Polio	Goforo Model Primary Health Center
28	35598	15/11/2019	12.116114	8.730628	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	eHA Polio	Tsamiya Babba Health Post
29	35624	15/11/2019	12.019875	8.747844	Gawo	KN1702	Gezawa	20010	Kano	KN	01/03/2019	Functional	Primary Health Center	National Primary Healthcare Development Agency	Primary	eHA Polio	Babawa Model Primary Health Care
30	35625	15/11/2019	12.088102	8.751995	Ketawa	KN1705	Gezawa	20010	Kano	KN	01/03/2019	Functional	General Hospital	National Primary Healthcare Development Agency	Primary	eHA Polio	Imamu Wali Primary Health Center
31	35730	15/11/2019	11.98348863	8.6212381	Tsamiya Babba	KN1708	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	Federal Ministry of Health	Secondary	eHA Polio	Gezawa General Hospital
32	35734	15/11/2019	12.123433	8.721703	Mesar Tudu	KN1706	Gezawa	20010	Kano	KN	01/03/2019	Functional	Dispensary	National Primary Healthcare Development Agency	Primary	eHA Polio	Mesa Tudu Health Post
33																	
34																	
35																	
36																	
37																	
38																	
39																	

Part 4: Consolidate data from multiple worksheets into one

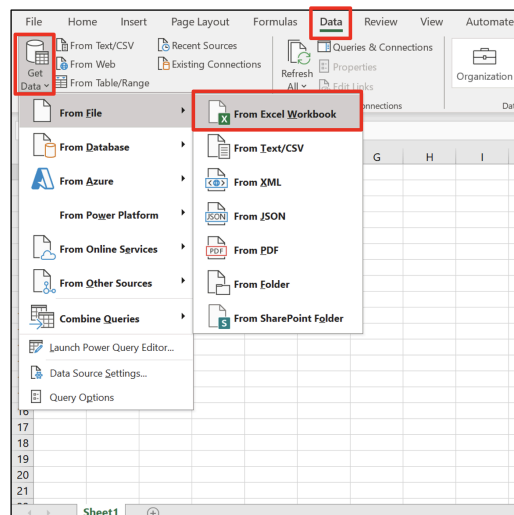
The table data across all worksheets should now be aligned and corrected and, as such, each worksheet could now easily be imported into GIS to generate individual datasets of health facilities(for each LGA), without any formatting issues. For this task, however, you are required to combine data from all eight (8) LGAs into a single dataset. A basic approach would be to manually copy the selected data from each worksheet and paste them into one worksheet. However, this can be time-consuming and prone to human error.

Exercise 4

In this exercise you'll learn how to consolidate data correctly using the **Append Query** from within the **Power Query Editor**.

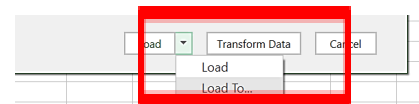
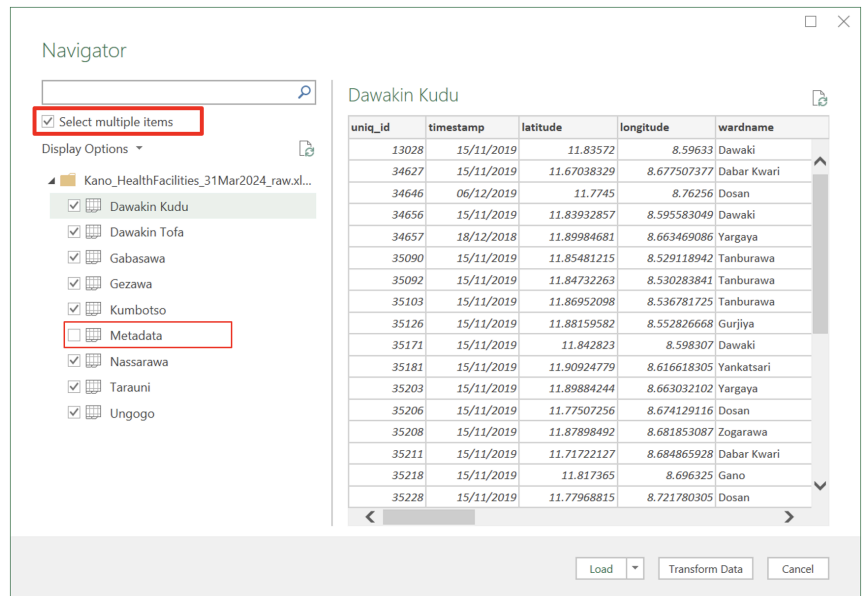
Step 1:

1. If you have not done so already, save your .xlsx file and **close the file**
2. Restart Excel with a blank workbook
3. Go to **Data > Get Data > From file > From Excel Workbook**

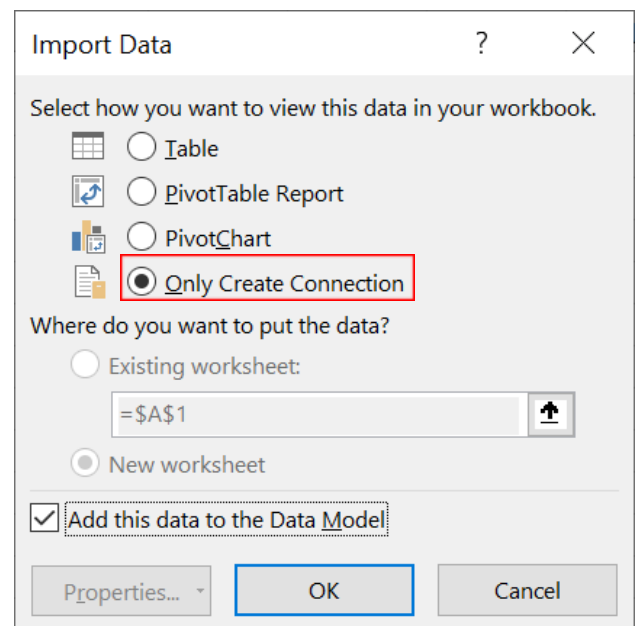


Step 2:

1. Navigate to your saved health facilities Excel file, and click **Import**
2. From the **Power Query Navigator**, tick **Select multiple items**
3. Tick all of the LGA data worksheets, except for Metadata
4. In the same **Navigator** window, click **Load** > **Load To...**

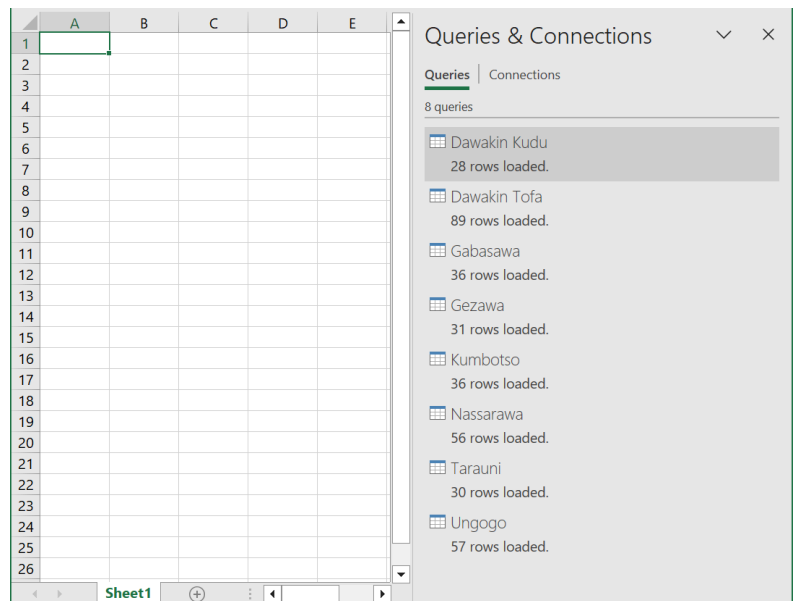


5. Click **Only Create Connection**. Then click **OK**



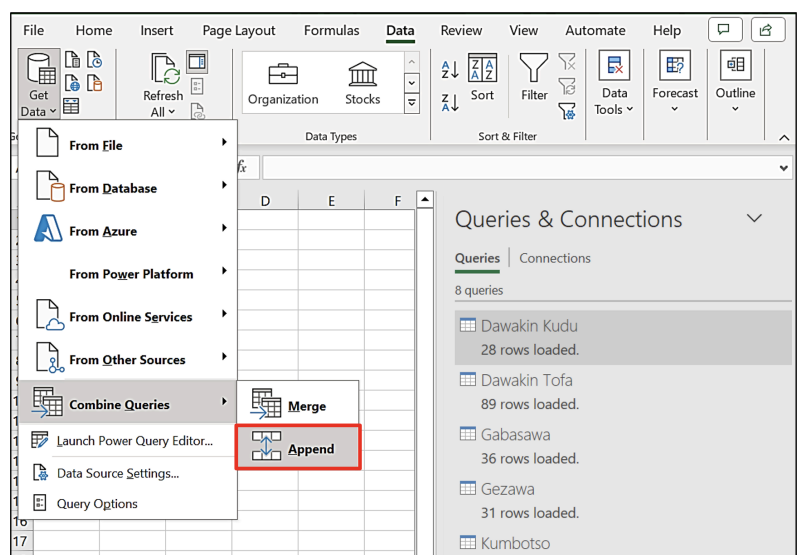
Back in your worksheet, the **Queries & Connections** panel displays the progress of your import.

At this stage, you only have connections to data on worksheets; you must complete a second stage in order to combine these data.

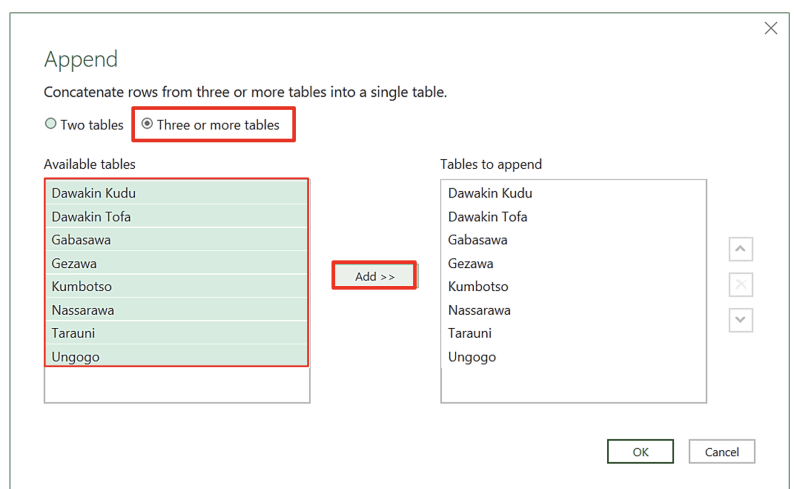


Step 3:

1. Go back to **Data > Get Data** and select **Combine Queries > Append**



2. Once the **Append** window appears, click **Three or more tables**,
3. Select all tables, and click **Add**
4. Click **OK**



The power query editor now builds your table; once it has concluded, it should report that your append table has 363 rows.

All that remains is to specify where to load the results of the query into a new worksheet.

	uniq_id	timestamp	latitude
1	13028	15/11/2019	11.83572
2	34627	15/11/2019	11.67038329
3	34646	06/12/2019	11.7745
4	34656	15/11/2019	11.83932857
5	34657	18/12/2018	11.89984681
6	35090	15/11/2019	11.85481215
7	35092	15/11/2019	11.84732263
8	35103	15/11/2019	11.86952098
9	35126	15/11/2019	11.88159582
10	35171	15/11/2019	11.842823
11	35181	15/11/2019	11.90924779
12	35203	15/11/2019	11.89884244
13	35206	15/11/2019	11.77507256
14	35208	15/11/2019	11.87898492
15	35211	15/11/2019	11.71722127
16	35218	15/11/2019	11.817365
17	35228	15/11/2019	11.77968815
18	35246	15/11/2019	11.77229633
19	35466	15/11/2019	11.877842
20	35472	15/11/2019	11.80734616
21			

Step 4:

1. Click **Close & Load**,
2. Select **Close & Load to...**

	timestamp
1	13028
2	34627
3	34646
4	34656
5	34657
6	35090
7	35092
8	35103
9	35126

3. In the window that appears, click **Table** and **New worksheet**

Import Data

Select how you want to view this data in your workbook.

☒ Table

☐ PivotTable Report

☐ PivotChart

☐ Only Create Connection

Where do you want to put the data?

☐ Existing worksheet:

☒ New worksheet

☐ Add this data to the Data Model

Properties... OK Cancel



Power Query now compiles the table into a new worksheet and confirms that it is composed of 360 rows. The data are now compiled into a single table—ready for deeper investigation and subsequent importation into GIS.

uniq_id	timestamp	latitude	longitude	wardname	wardcode	lganame
13028	15/11/2019	11.83572	8.59633	Dawaki	KN0903	Dawakin Kudu
34627	15/11/2019	11.67038329	8.677507377	Dabar Kwari	KN0901	Dawakin Kudu
34646	06/12/2019	11.7745	8.76256	Dosan	KN0905	Dawakin Kudu
34656	15/11/2019	11.83932857	8.595583049	Dawaki	KN0903	Dawakin Kudu
34657	18/12/2018	11.89984681	8.663469086	Yargaya	KN0914	Dawakin Kudu
35090	15/11/2019	11.85481215	8.529118942	Tanburawa	KN0909	Dawakin Kudu
35092	15/11/2019	11.84732263	8.530283841	Tanburawa	KN0909	Dawakin Kudu
35103	15/11/2019	11.86952098	8.536781725	Tanburawa	KN0909	Dawakin Kudu
35126	15/11/2019	11.88159582	8.552826668	Gurjiya	KN0907	Dawakin Kudu
35171	15/11/2019	11.842823	8.598307	Dawaki	KN0903	Dawakin Kudu
35181	15/11/2019	11.90924779	8.616618305	Yankatsari	KN0913	Dawakin Kudu
35203	15/11/2019	11.89884244	8.663032102	Yargaya	KN0914	Dawakin Kudu
35206	15/11/2019	11.77507256	8.674129116	Dosan	KN0905	Dawakin Kudu
35208	15/11/2019	11.87898492	8.681853087	Zogarawa	KN0915	Dawakin Kudu
35211	15/11/2019	11.71722127	8.684865928	Dabar Kwari	KN0901	Dawakin Kudu
35218	15/11/2019	11.817365	8.696325	Gano	KN0906	Dawakin Kudu
35228	15/11/2019	11.77968815	8.721780305	Dosan	KN0905	Dawakin Kudu
35246	15/11/2019	11.77229633	8.763639536	Dosan	KN0905	Dawakin Kudu
35466	15/11/2019	11.877842	8.628317	Unguwar Duniya	KN0911	Dawakin Kudu
35472	15/11/2019	11.80734616	8.79910493	Danbagina	KN0902	Dawakin Kudu
35563	15/11/2019	11.83982	8.601726	Dawaki	KN0903	Dawakin Kudu
35566	15/11/2019	11.89596499	8.620570334	Yankatsari	KN0913	Dawakin Kudu
35568	18/12/2018	11.79794943	8.642285753	Tsakuwa	KN0910	Dawakin Kudu
35574	15/11/2019	11.864045	8.70367	Dawakiji	KN0904	Dawakin Kudu
35576	15/11/2019	11.83621484	8.730740535	Gano	KN0906	Dawakin Kudu

Note that Excel applies colored styling to the table by default. With regard to saving as CSV format, such styling is irrelevant and will not be retained in the CSV. If you wish to clear the styling, you can do so from the **Table Styles** section of the user ribbon.

It is important to validate the results of your query, so take a moment to check the data. Filtering on the *lganame* confirms that the table contains all eight (8) LGAs, correctly named with no duplicates.



unqid	timestamp	latitude	longitude	wardname	wardcode	lganame	lgacode	statename	statecode	updated_on	func_stats
13028	15/11/2019	11.83572	8.59633	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
34627	15/11/2019	11.67038329	8.677507377	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
34646	06/12/2019	11.7745	8.76256	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
34656	15/11/2019	11.83932857	8.595583049	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
34657	18/12/2018	11.89984681	8.663469086	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35090	15/11/2019	11.85481215	8.529118942	Tanburawa	KN0909	Tanburawa	20022	Kano	KN	01/03/2019	Functional
35092	15/11/2019	11.84732263	8.530283841	Tanburawa	KN0909	Tanburawa	20022	Kano	KN	01/03/2019	Functional
35103	15/11/2019	11.86952098	8.536781725	Tanburawa	KN0909	Tanburawa	20022	Kano	KN	01/03/2019	Functional
35126	15/11/2019	11.88159582	8.552826668	Gurjiya	KN0907	Gurjiya	20022	Kano	KN	01/03/2019	Functional
35171	15/11/2019	11.842823	8.598307	Dawaki	KN0903	Dawaki	20022	Kano	KN	01/03/2019	Functional
35181	15/11/2019	11.90924779	8.616618305	Yankatsari	KN0913	Yankatsari	20022	Kano	KN	01/03/2019	Functional
35203	15/11/2019	11.89884244	8.663032102	Yargaya	KN0914	Yargaya	20022	Kano	KN	01/03/2019	Functional
35206	15/11/2019	11.77507256	8.674129116	Dosan	KN0905	Dosan	20022	Kano	KN	01/03/2019	Functional
35208	15/11/2019	11.87898492	8.681853087	Zogarawa	KN0915	Zogarawa	20022	Kano	KN	01/03/2019	Functional
35211	15/11/2019	11.71722127	8.684865928	Dabar Kwari	KN0901	Dabar Kwari	20022	Kano	KN	01/03/2019	Functional
35218	15/11/2019	11.817365	8.696325	Gano	KN0906	Gano	20022	Kano	KN	01/03/2019	Functional
35228	15/11/2019	11.77968815	8.721780305	Dosan	KN0905	Dosan	20022	Kano	KN	01/03/2019	Functional
35246	15/11/2019	11.77229633	8.763639536	Dosan	KN0905	Dosan	20022	Kano	KN	01/03/2019	Functional
35466	15/11/2019	11.877842	8.628317	Unguwar Duniya	KN0911	Unguwar Duniya	20022	Kano	KN	01/03/2019	Functional
35472	15/11/2019	11.80734616	8.79910493	Danbagina	KN0902	Danbagina	20022	Kano	KN	01/03/2019	Functional
35563	15/11/2019	11.83982	8.601726	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35566	15/11/2019	11.89596499	8.620570334	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35568	18/12/2018	11.79794943	8.642285753	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35574	15/11/2019	11.864045	8.70367	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35576	15/11/2019	11.83621484	8.730740535	Dawakin Kudu	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional
35692	15/11/2019	11.91278798	8.64879916	Jido	KN0908	Dawakin Kudu	20022	Kano	KN	01/03/2019	Functional

However, notice that there are blank cells (*Blanks*) listed under the *lganame* column. You may have noticed these missing values as you worked through the data in this task. These and other table cell errors/omissions will be addressed in **Task 3**.

It is important to ensure that the table data record remains complete outside of GIS. Although the objective is for the data to be imported to GIS and drive subsequent analysis, traceability is vital—one must be able to trace back to the raw data in case any issues arise.

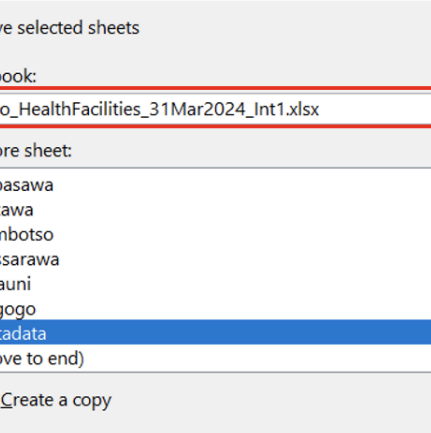
For good practice, you should embed your “appended” worksheet back into the original Excel file, alongside its metadata and individual LGA data.

Step 5:

1. Reopen your original Excel data file: *Kano_HealthFacilities_31Mar2024_int1.xlsx*
2. Back in your appended data table, right-click on the worksheet named **Append1** and select **Move or Copy...** from the sub-menu

7	35090	15/11	11.85481215	8.529118942	Tanburawa	KN0909
8	35092	15/11	11.84732263	8.530283841	Tanburawa	KN0909
9	35103	15/11	11.86952098	8.536781725	Tanburawa	KN0909
10	35126	15/11	11.88159582	8.552826668	Gurjiya	KN0907
11	35171	15/11	11.842823	8.598307	Dawaki	KN0903
12	35181	15/11	11.90924779	8.616618305	Yankatsari	KN0913
13	35203	15/11	11.89884244	8.663032102	Yargaya	KN0914
14	35206	15/11	11.77507256	8.674129116	Dosan	KN0905
15	35208	15/11	11.87898492	8.681853087	Zogarawa	KN0915
16	35211	15/11	11.71722127	8.684865928	Dabar Kwari	KN0901
17	35218	15/11	11.817365	8.696325	Gano	KN0906
18	35228	15/11	11.77968815	8.721780305	Dosan	KN0905
19	35246	15/11	11.77229633	8.763639536	Dosan	KN0905
20	35466	15/11	11.877842	8.628317	Unguwar Duniya	KN0911
21	35472	15/11	11.80734616	8.79910493	Danbagina	KN0902



- 
- Move or Copy
- Move selected sheets
- To book:
- Kano_HealthFacilities_31Mar2024_Int1.xlsx
- Before sheet:
- Gabasawa
 - Gezawa
 - Kumbotso
 - Nassarawa
 - Tarauni
 - Ungogo
 - Metadata
 - (move to end)
- ☒ Create a copy
- OK OK
- Cancel

	A	B	C	D	E	F	G	H	I	J	K	
1	uniq_id	timestamp	latitude	longitude	wardname	wardcode	lganame	lgacode	statename	statecode	updated_on	
2	13028	15/11/2019	11.83572	8.59633	Dawaki	KN0903	Dawakin Kudu	20022	Kano	KN	01/03/2019	
3	34627	15/11/2019	11.67038329	8.677507377	Dabar Kwari	KN0901	Dawakin Kudu	20022	Kano	KN	01/03/2019	
4	34646	06/12/2019	11.7745	8.76256	Dosan	KN0905	Dawakin Kudu	20022	Kano	KN	01/03/2019	
5	34656	15/11/2019	11.83932857	8.595583049	Dawaki	KN0903	Dawakin Kudu	20022	Kano	KN	01/03/2019	
6	34657	18/12/2018	11.89984681	8.663469086	Yargaya	KN0914	Dawakin Kudu	20022	Kano	KN	01/03/2019	
7	35090	15/11/2019	11.85481215	8.529118942	Tanburawa	KN0909	Dawakin Kudu	20022	Kano	KN	01/03/2019	
8	35092	15/11/2019	11.84732263	8.530283841	Tanburawa	KN0909	Dawakin Kudu	20022	Kano	KN	01/03/2019	
9	35103	15/11/2019	11.86952098	8.536781725	Tanburawa	KN0909	Dawakin Kudu	20022	Kano	KN	01/03/2019	
10	35126	15/11/2019	11.88159582	8.552826668	Gurjiya	KN0907	Dawakin Kudu	20022	Kano	KN	01/03/2019	
11	35171	15/11/2019	11.842823	8.598307	Dawaki	KN0903	Dawakin Kudu	20022	Kano	KN	01/03/2019	
12	35181	15/11/2019	11.90924779	8.616618305	Yankatsari	KN0913	Dawakin Kudu	20022	Kano	KN	01/03/2019	
13	35203	15/11/2019	11.89884244	8.663032102	Yargaya	KN0914	Dawakin Kudu	20022	Kano	KN	01/03/2019	
14	35206	15/11/2019	11.77507256	8.674129116	Dosan	KN0905	Dawakin Kudu	20022	Kano	KN	01/03/2019	
15	35208	15/11/2019	11.87898492	8.68185087	Zogarawa	KN0915	Dawakin Kudu	20022	Kano	KN	01/03/2019	
16	35211	15/11/2019	11.71722127	8.684865928	Dabar Kwari	KN0901	Dawakin Kudu	20022	Kano	KN	01/03/2019	
17	35218	15/11/2019	11.817365	8.696325	Gano	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	
18	35228	15/11/2019	11.77968815	8.721780305	Dosan	KN0905	Dawakin Kudu	20022	Kano	KN	01/03/2019	
19	35246	15/11/2019	11.77229633	8.763639536	Dosan	KN0905	Dawakin Kudu	20022	Kano	KN	01/03/2019	
20	35466	15/11/2019	11.877842	8.628317	Unguwar Duniya	KN0911	Dawakin Kudu	20022	Kano	KN	01/03/2019	
21	35472	15/11/2019	11.80734616	8.79910493	Danbagina	KN0902	Dawakin Kudu	20022	Kano	KN	01/03/2019	
22	35563	15/11/2019	11.83982	8.601726	Dawaki	KN0903	Dawakin Kudu	20022	Kano	KN	01/03/2019	
23	35566	15/11/2019	11.89596499	8.620570334	Yankatsari	KN0913	Dawakin Kudu	20022	Kano	KN	01/03/2019	
24	35568	18/12/2018	11.79794943	8.642285753	Tsakuwa	KN0910	Dawakin Kudu	20022	Kano	KN	01/03/2019	
25	35574	15/11/2019	11.864045	8.70367	Dawakiji	KN0904	Dawakin Kudu	20022	Kano	KN	01/03/2019	
26	35576	15/11/2019	11.83621484	8.730740535	Gano	KN0906	Dawakin Kudu	20022	Kano	KN	01/03/2019	
«	»	Dawakin Tofa	Dawakin Kudu	Gabasawa	Gezawa	Kumbotso	Nassarawa	Tarauni	Ungogo	CombinedData	Metadata	⊕

Summary

Learning checklist

You have now completed the exercises in Task 2, demonstrating good practice in data preparation and management for GIS. You can confidently say you have:

- Created intermediate-level data reflecting changes to raw data
- Transposed health facility data from being organised by column to being organised by row
- Addressed anomalies concerning column headers (which would generate errors on import, if not corrected)
- Consolidated data spread across multiple tabs into a single worksheet via Excel power query

In the next task, you will inspect your data cell values by hunting for errors and other anomalies which could disrupt your subsequent GIS data import.

