

International Fetal Growth Standards: Application



User guide

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April 2017

HOW TO

1. INSTALL AND OPEN THE APPLICATION

WHERE CAN I FIND THE APP AND HOW DO I INSTALL IT?

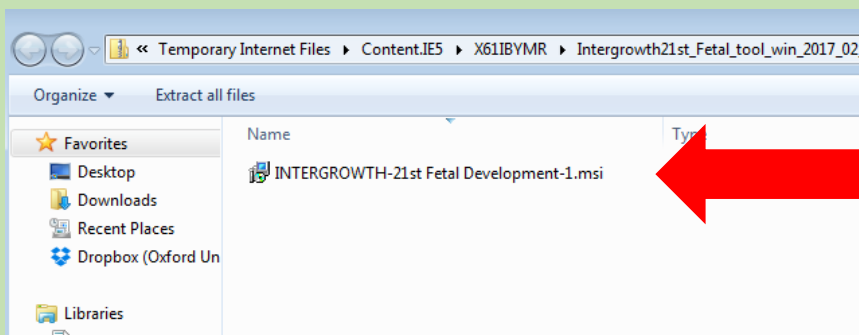
The International Fetal Growth Standards application can be downloaded from the following links on the INTERGROWTH-21st Project website on the Global Health Network:
<https://intergrowth21.tghn.org/standards-tools/> or <http://bit.ly/IG21Tools>.

The application is available in 3 formats: for Windows, for Apple Mac and an online browser-based version, which requires internet connection.

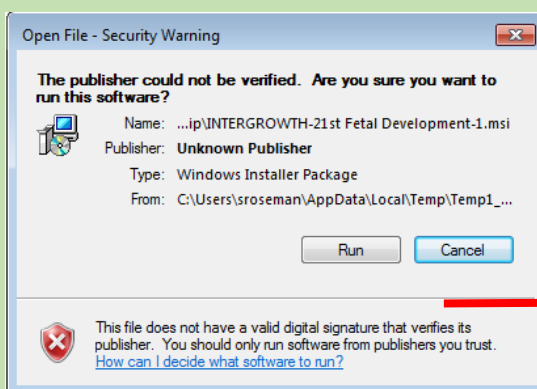
If you choose to download the application, it should by default be saved in the “Download” folder (unless you changed your preferences). Once downloaded, proceed to install the application.

On Windows

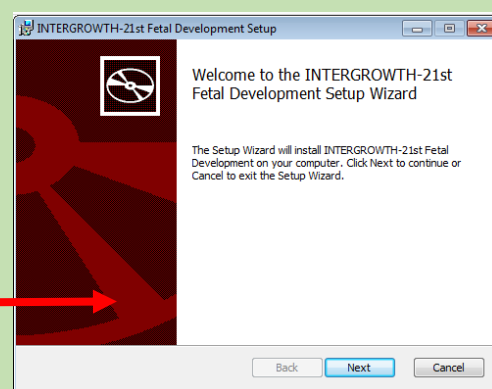
Double-click on “INTERGROWTH-21st Fetal Development-1.msi”



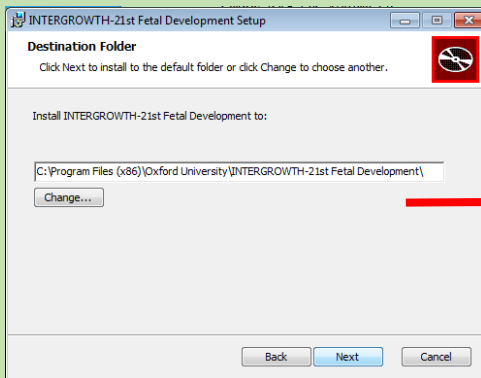
Click “Run”



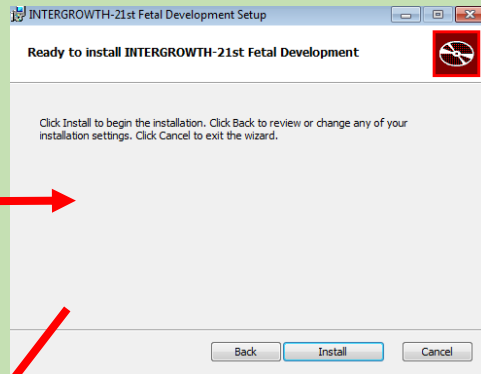
Click “Next”



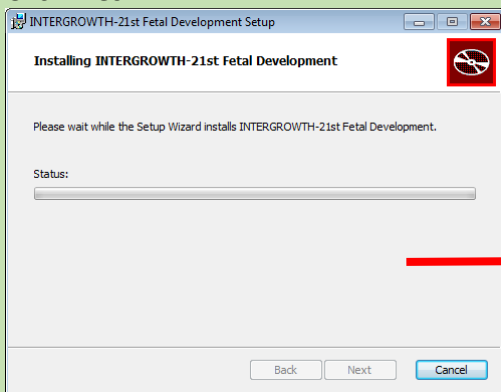
Click "Next", again



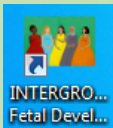
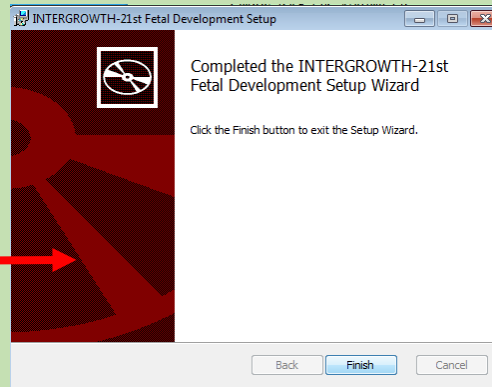
Then click "Install"

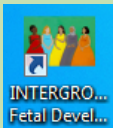


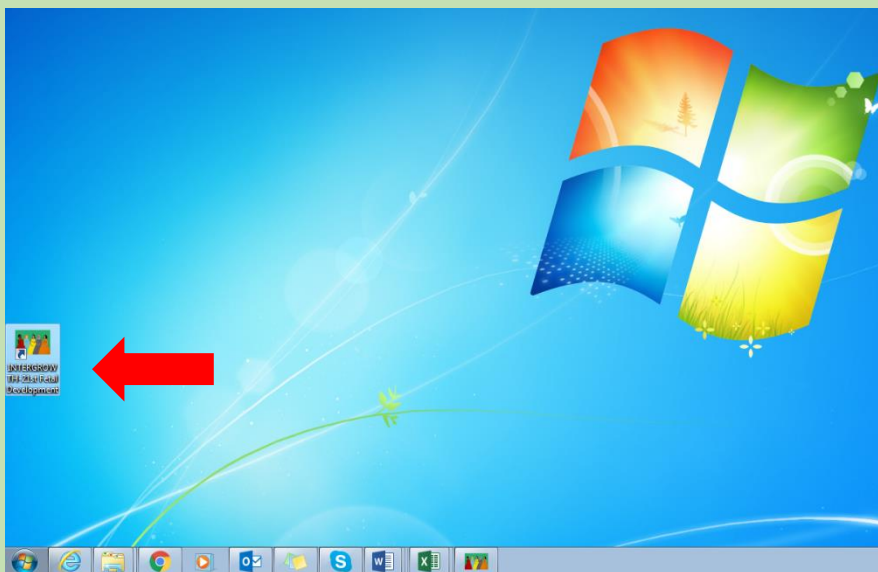
A screen will appear and your computer will ask permission to install the program. Click 'Yes'



Once the installation is finished, click 'Finish'



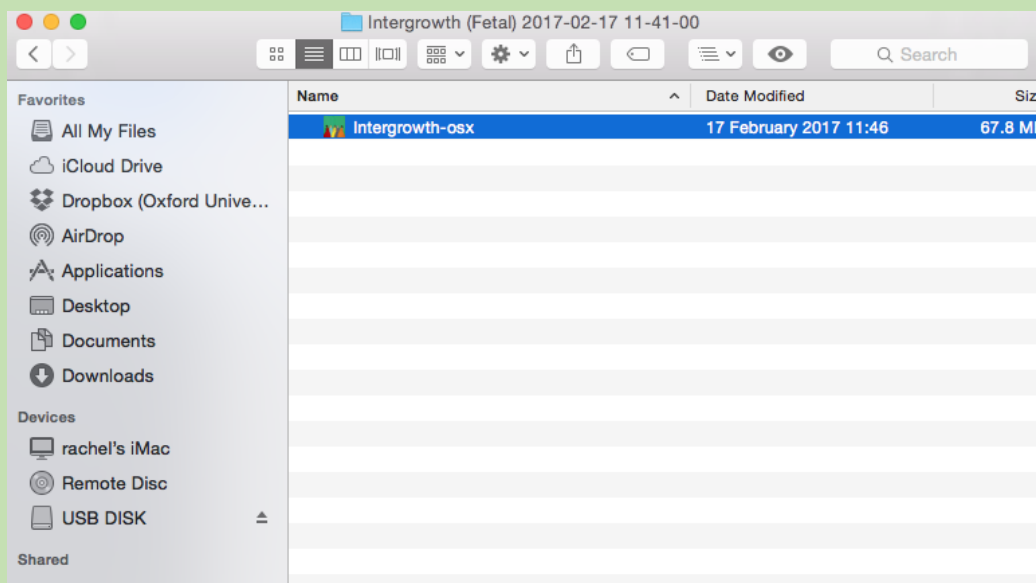
An icon  will appear on your desktop.



Note: other versions of Windows may differ slightly.

On an Apple Mac

Go to the “Download” folder, select and open the “Intergrowth (Fetal) 2017-02-17 11-41-00” file (the name of the file may change for more recent versions of the application). The computer will unzip the file. The following screen should appear.



Once installed, you can (1) move the app to the “Launchpad” or (2) pin it in the “Dock” or (3) create a shortcut on the desktop.

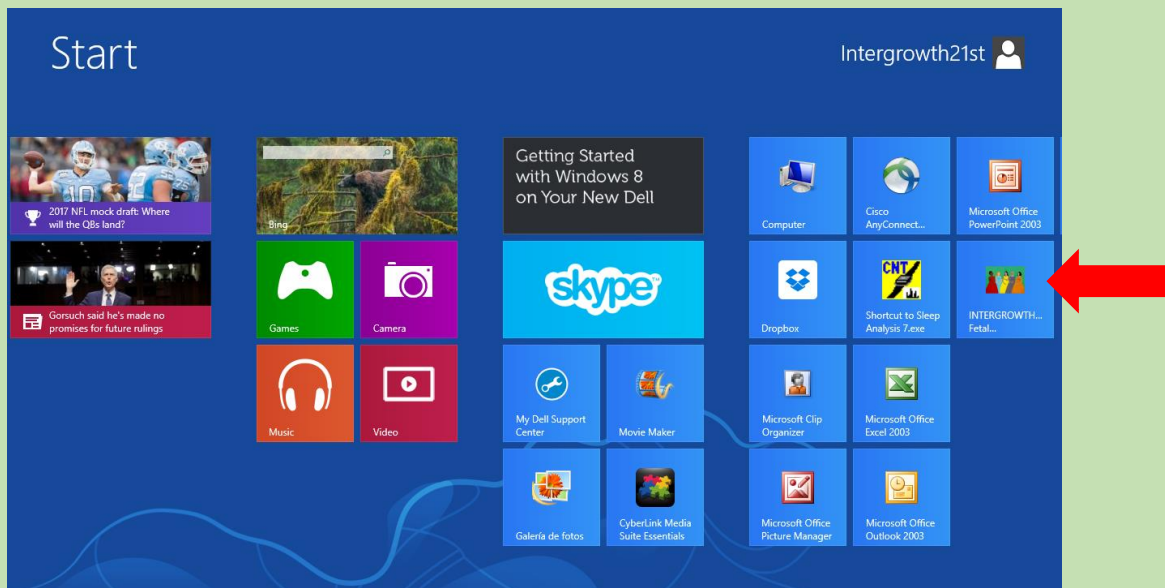
When you open the application, the INTERGROWTH-21st application icon will appear in the dock. The app can be used by clicking on this icon.



HOW TO OPEN THE APPLICATION

For Windows 7 and above

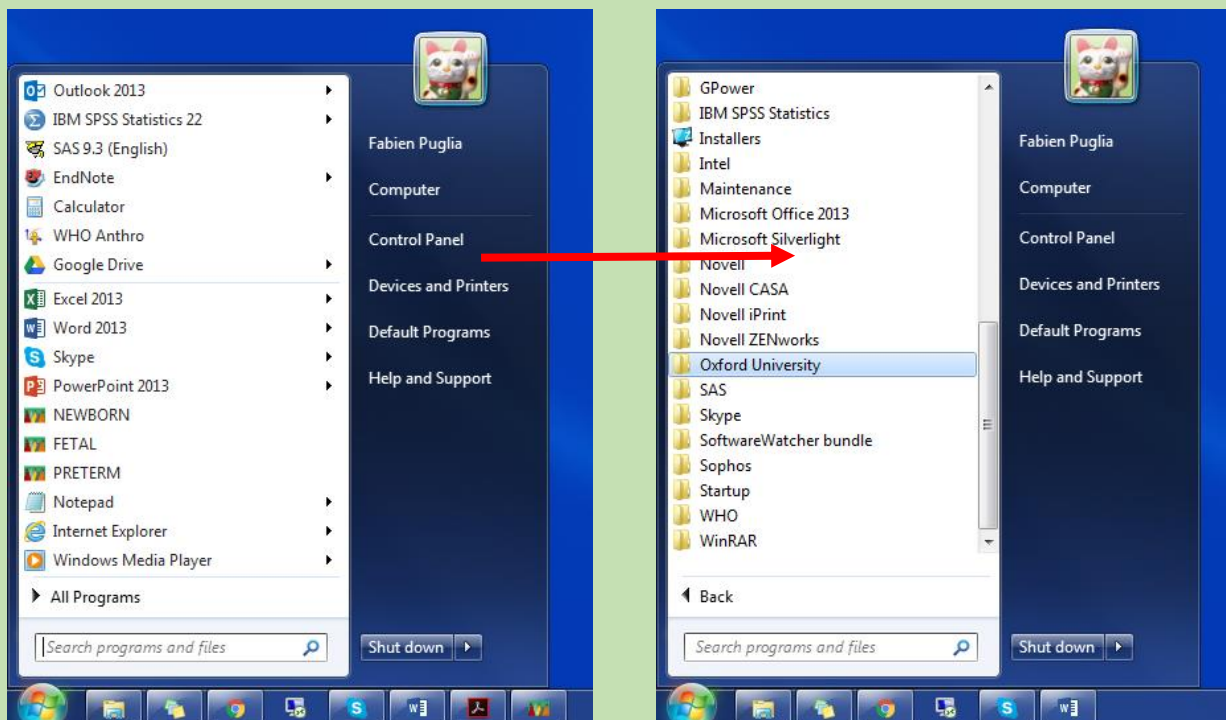
Open the INTERGROWTH-21st application



For previous versions of Windows

Click on the icon on the desktop or

Click on the “Start” icon at the bottom left of your screen. Go to “All programs”, then “Oxford University” folder and select the INTERGROWTH-21st Fetal Growth Standards application from the list.



On an Apple Mac

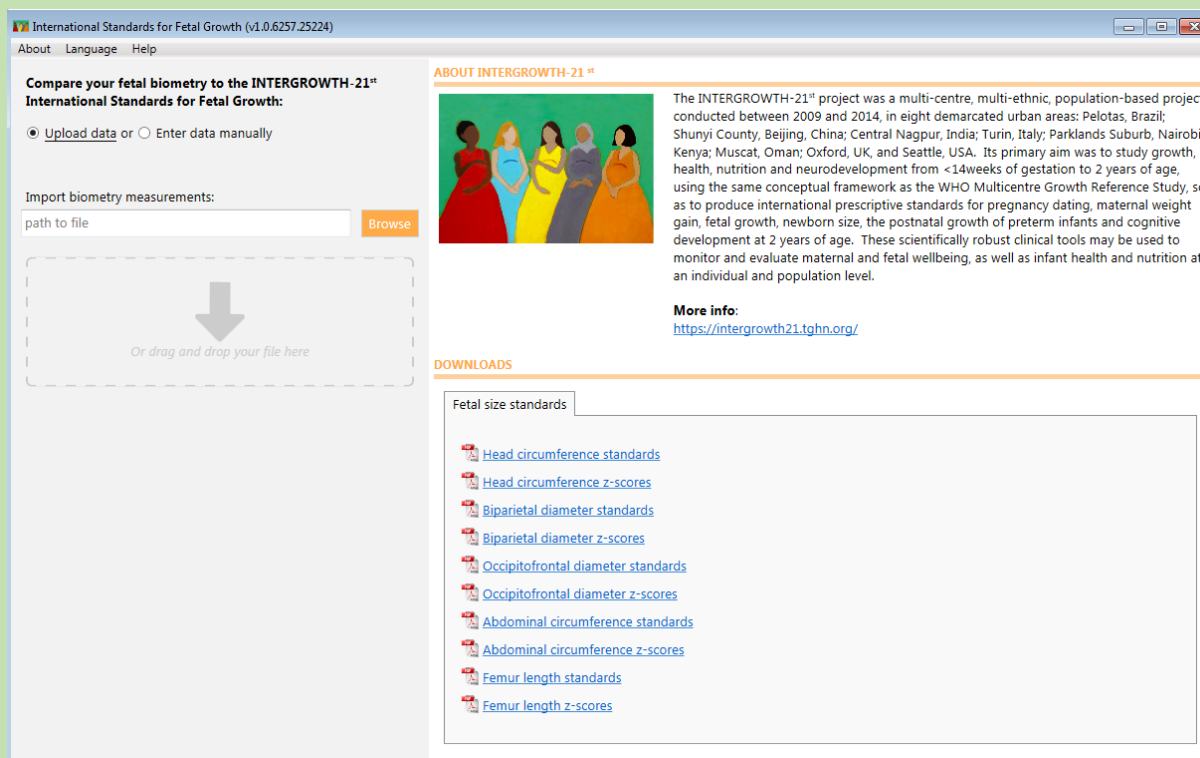
Click on the application icon to open it. The application can be found on the Launchpad, dock bar or desktop, depending on how you set it up.

DESCRIPTION OF THE APPLICATION

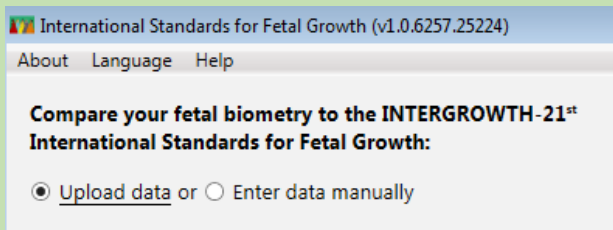
The application first opens on its home screen. The home screen is divided into 3 panes:

- On the upper right pane, there is a brief description of the INTERGROWTH-21st Project and a link to the Project's website
- On the lower right pane, you will find a tab labelled "Fetal size standards" which contain links to the tables of centiles and z-score values for head circumference, bi-parietal diameter, occipito-frontal diameter, abdominal circumference and femur length
- On the left pane, you will find options to enter data manually or upload the file

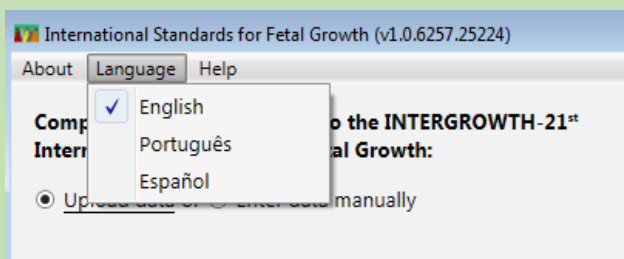
Home screen



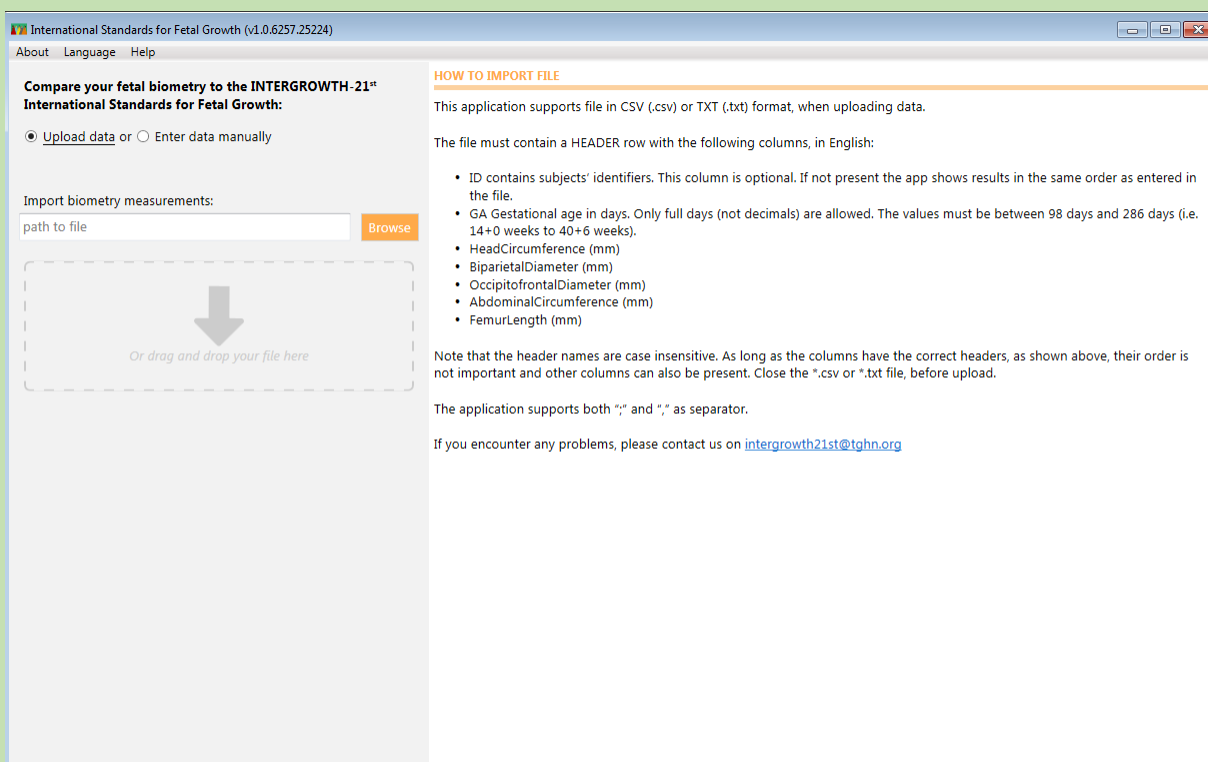
The menu bar at the top of the home screen has 3 options:



1. "About" takes you back to the home screen
2. "Language" offers the user a language option (English, Portuguese or Spanish) to operate the app. Choose the appropriate one for you



3. "Help" takes you to the help screen where you can find instructions on how to format your data correctly as well as an email address to contact us if you encounter any problems



The application is ready to use!

HOW TO

2. COMPARE THE GROWTH OF MANY FETUSES TO THE STANDARDS

WHAT THE APP CAN DO FOR YOU

The application allows you to upload a *.csv or *.txt file with biometric data for an unlimited number of fetuses (as an input), and download a file with z-scores and centiles for all biometric data (as an output).

HOW TO PROCEED

1. Prepare your data

The easiest way to proceed is to create a file in Excel according to the instructions in the table and examples presented below.

Column	ID	Gestational age	Biometric data
Header	ID	GA	<ul style="list-style-type: none"> • Headcircumference • Biparietaldiameter • Occipitofrontaldiameter • Abdominalcircumference • Femurlength
Content	Any alphanumerical identifier	Integer number without decimals in days Range: 14+0 to 40+0 weeks' gestation, i.e. 98 to 280 days	All measurements should be in mm, with up to 1 decimal place
Comment	Not compulsory, the app will present results in the same order as they appear in the original file	Compulsory	Not compulsory

The column headings are not case-sensitive and their order is not fixed; other columns can also be present. What is important is that the headers appear as presented in the red box.

	A	B	C	D	E	F
1	GA	HeadCircumference	BiparietalDiameter	OccipitofrontalDiameter	AbdominalCircumference	FemurLength
2	98	87.38	26.13	31.28	88.87	15.96
3		99.22	28.92	35.62	101.51	19.28
4	112		31.8	39.98	114.04	22.51
5	119	123.04		44.32	126.45	25.66
6	126	134.94	37.75		138.75	28.73
7	133	146.77	40.78	52.91		31.72
8	140	158.49	43.85	57.14	162.98	
9	147	170.06	46.92	61.28	174.92	37.47
10						
11	161	192.59	53.05	69.31	198.49	42.92
12	168	203.48	56.08	73.16	210.12	45.53

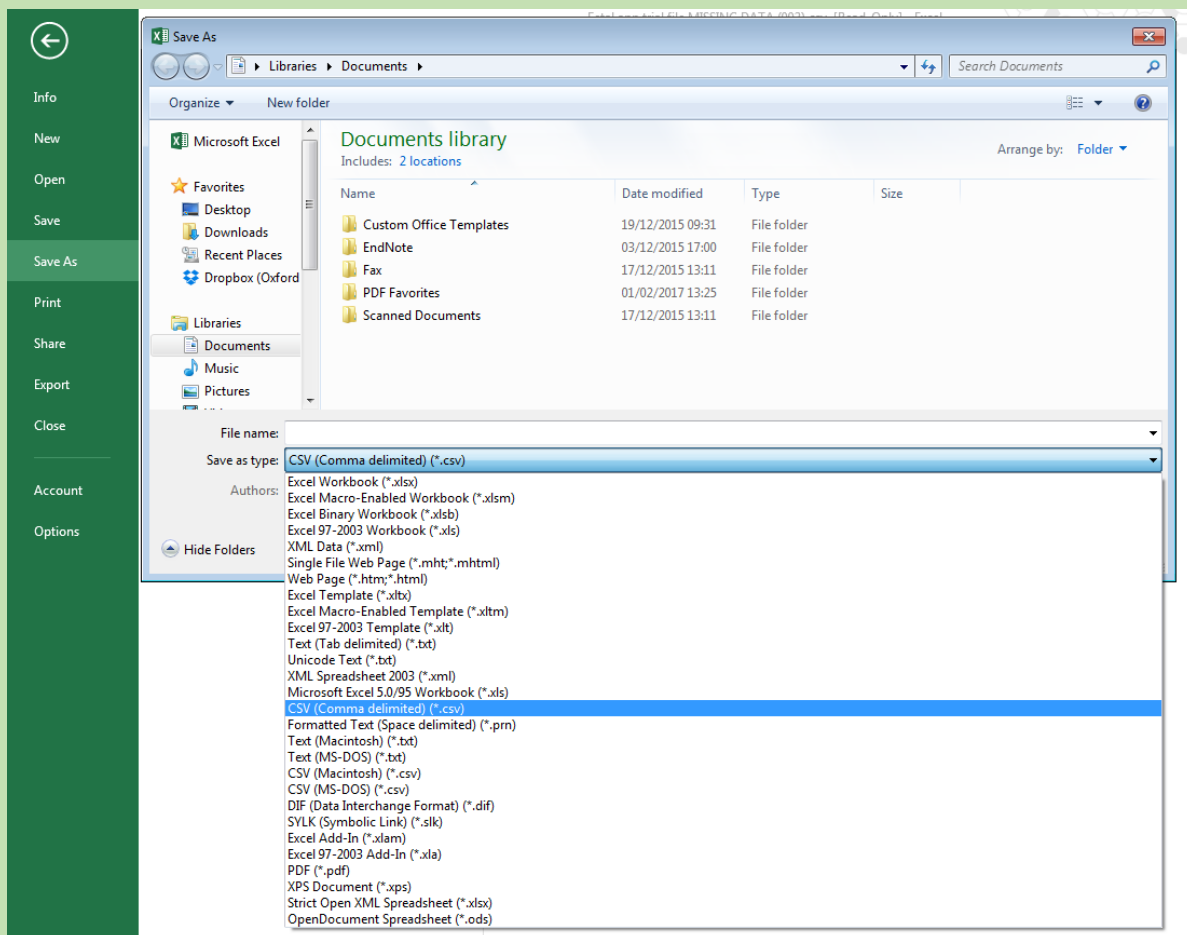
	A	B	C	D	E	F	G	H
1	ID	GA	Placenta position	BiparietalDiameter	AbdominalCircumference	FemurLength	OccipitofrontalDiameter	HeadCircumference
2	07-001	98	Posterior high	87.38	88.87	15.96	31.28	26.13
3	name1	105	Anterior low	99.22	101.51	19.28	35.62	28.92
4	07-002	112	Posterior low	111.12	114.04	22.51	39.98	31.8
5	name2	119	Posterior low	123.04	126.45	25.66	44.32	34.75
6	07-003	126	Posterior low	134.94	138.75	28.73	48.64	37.75
7	name3	133	Anterior high	146.77	150.92	31.72	52.91	40.78
8	07-004	140	Posterior high	158.49	162.98	34.63	57.14	43.85
9	name4	147	Posterior high	170.06	174.92	37.47	61.28	46.92
10	07-005	154	Posterior low	181.44	186.76	40.23	65.35	49.99
11	name5	161	Anterior low	192.59	198.49	42.92	69.31	53.05
12	07-006	168	Posterior high	203.48	210.12	45.53	73.16	56.08

For the biometric data, decimals can be separated by either a comma or decimal point (e.g. “2,5” or “2.5”)

2. Save your file

The application supports both *.csv and *.txt format. Save your Excel file as *.csv

File → Save as → Choose the location of your file → Enter the file name → Choose the *.csv format from the dropdown menu → Press “Save”



Do not save your file directly from Excel to *.txt. If you do so, the resulting *.txt file will be tab delimited and the application only supports *.txt files using a comma or a decimal point as separators. An error message will appear when you try to upload a tab-delimited *.txt file (see Troubleshooting section, 3).

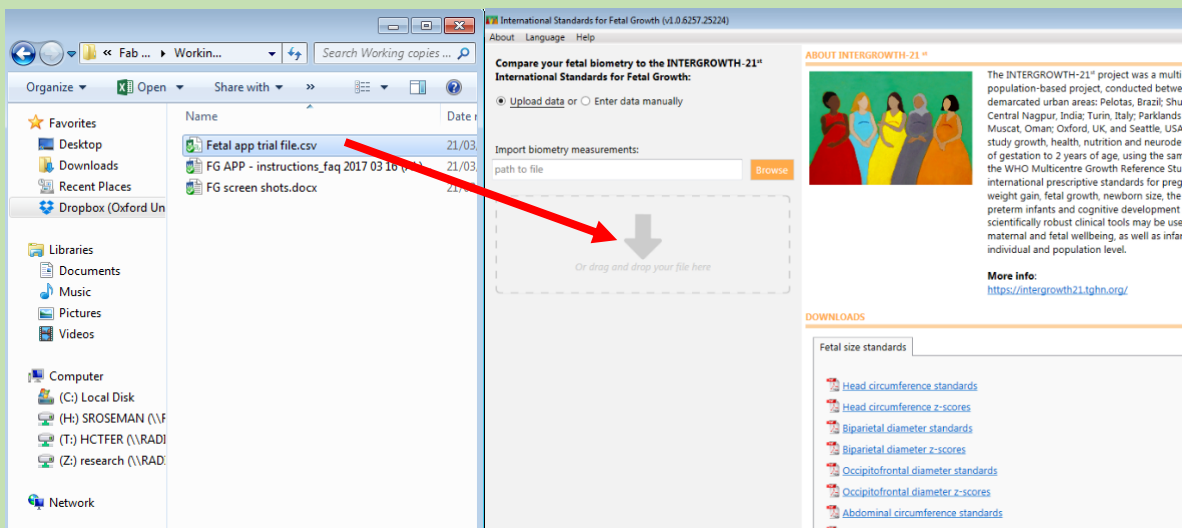
Once saved, close your dataset.

3. Open the application

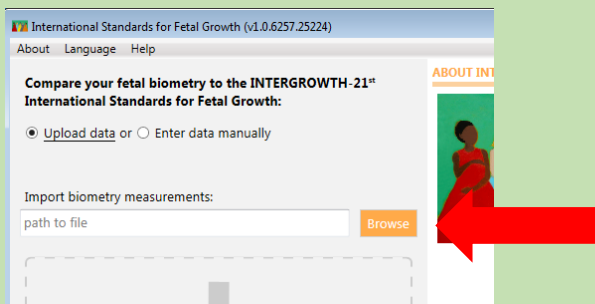
If not already open, see previous section on where to find and how to open the application on your computer.

4. Upload your file

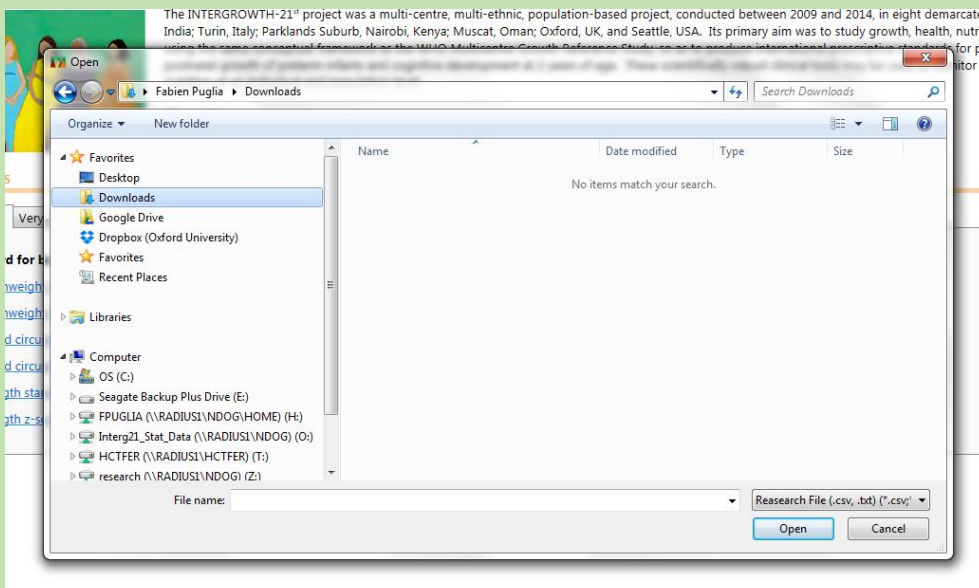
Either drag and drop your file to the dedicated zone as follows (Note that the “drag and drop” option only works for *.csv files)



Or use the “Browse” button on the application



Locate and select your file. Click ‘Open’



At this point, the app will automatically calculate and display the results

Child	Age (d)	Head circumference (mm)			Biparietal diameter (mm)			Occipitofrontal diameter (mm)			Abdominal circumference (mm)			Femur length (mm)		
		mm	z-score	centile	mm	z-score	centile	mm	z-score	centile	mm	z-score	centile	mm	z-score	centile
1	98	87.38	-1.8806	3.00	26.13	-1.9985	2.28	31.28	-1.2817	10.00	88.87	1.9991	97.72	15.96	1.8793	96.99
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	112	N/A	N/A	N/A	31.80	-2.0025	2.26	39.98	-1.2778	10.07	114.04	1.9998	97.72	22.51	1.8797	96.99
4	119	123.04	-1.8808	3.00	N/A	N/A	N/A	44.32	-1.2792	10.04	126.45	1.9994	97.72	25.66	1.8803	97.00
5	126	134.94	-1.8804	3.00	37.75	-1.9992	2.28	N/A	N/A	N/A	138.75	2.0003	97.73	28.73	1.8811	97.00
6	133	146.77	-1.8803	3.00	40.78	-2.0027	2.26	52.91	-1.2814	10.00	N/A	N/A	N/A	31.72	1.8812	97.00
7	140	158.49	-1.8803	3.00	43.85	-1.9996	2.28	57.14	-1.2782	10.06	162.98	1.9999	97.72	N/A	N/A	N/A
8	147	170.06	-1.8804	3.00	46.92	-2.0019	2.26	61.28	-1.2816	10.00	174.92	1.9995	97.72	37.47	1.8818	97.01
		N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
10	161	192.59	-1.8806	3.00	53.05	-2.0023	2.26	69.31	-1.2803	10.02	198.49	2.0005	97.73	42.92	1.8824	97.00
11	168	203.48	-1.8797	3.01	56.08	-2.0014	2.27	73.16	-1.2797	10.03	210.12	2.0002	97.73	45.53	1.8802	97.00
12	175	214.05	-1.8805	3.00	59.06	-2.0025	2.26	76.88	-1.2793	10.04	221.66	1.9996	97.72	48.07	1.8791	96.99
13	182	224.28	-1.8807	3.00	61.98	-2.0037	2.26	80.45	-1.2811	10.01	233.13	1.9996	97.72	50.54	1.8788	96.99
14	189	234.13	-1.8805	3.00	64.83	-2.0031	2.26	83.87	-1.2809	10.01	244.54	2.0001	97.73	52.94	1.8788	96.99
15	196	243.56	-1.8801	3.00	67.59	-2.0023	2.26	87.12	-1.2808	10.01	255.89	1.9996	97.72	55.27	1.8788	96.99
16	203	252.52	-1.8809	3.00	70.24	-2.0024	2.26	90.19	-1.2797	10.03	267.21	1.9998	97.72	57.53	1.8782	96.98
17	210	260.99	-1.8807	3.00	72.76	-2.0045	2.25	93.06	-1.2796	10.03	278.51	1.9999	97.72	59.73	1.8812	97.00
18	217	268.92	-1.8810	3.00	75.15	-2.0028	2.26	95.72	-1.2794	10.04	289.81	2.0003	97.73	61.85	1.8785	96.98
19	224	276.28	-1.8806	3.00	77.37	-2.0045	2.25	98.15	-1.2808	10.01	301.12	2.0004	97.73	63.91	1.8785	96.98
20	231	283.02	-1.8807	3.00	79.42	-2.0036	2.26	100.35	-1.2804	10.02	312.46	2.0001	97.73	65.91	1.8805	97.00
21	238	289.11	-1.8805	3.00	81.27	-2.0037	2.26	102.30	-1.2798	10.03	323.86	2.0003	97.73	67.84	1.8800	96.99
22	245	294.50	-1.8809	3.00	82.90	-2.0047	2.25	103.98	-1.2802	10.02	335.33	2.0000	97.73	69.71	1.8804	97.00
23	252	299.16	-1.8808	3.00	84.29	-2.0064	2.24	105.38	-1.2805	10.02	346.90	2.0000	97.73	71.52	1.8812	97.00
24	259	303.05	-1.8804	3.00	85.43	-2.0055	2.25	106.49	-1.2794	10.04	358.59	1.9999	97.72	73.26	1.8782	96.98
25	266	306.12	-1.8803	3.00	86.28	-2.0070	2.24	107.28	-1.2795	10.04	370.43	2.0001	97.73	74.96	1.8815	97.00
26	273	308.33	-1.8806	3.00	86.83	-2.0072	2.24	107.74	-1.2791	10.04	382.44	2.0002	97.73	76.59	1.8798	96.99
27	280	309.64	-1.8809	3.00	87.05	-2.0071	2.24	107.84	-1.2797	10.03	394.64	2.0001	97.73	78.17	1.8792	96.99

5. Read the data

The app displays “N/A” (Not Applicable) in the result pane:

- For a whole line if GA is missing (line 2)
- For a specific measurement, if no data were present in the file (lines 3-7)

6. Export the data

Click the “Export” button on the top right corner of the result pane. Then select a location for your file, enter a name, and click Save. The exported file is a *.csv with new z-score and centile columns for each measure (head circumference, bi-parietal diameter, occipito-frontal diameter, abdominal circumference and femur length).

Results can also be directly copied and pasted from the application.

7. Compare a new batch of data

To upload a new *.csv or *.txt file for comparison with the standards, first remove the previous file by clicking on the trash bin icon. Then start again from step 3.

HOW TO

3. COMPARE THE SIZE OF A SINGLE FETUS TO THE STANDARDS

WHAT THE APP CAN DO FOR YOU

The application allows you to enter biometric data (head circumference, bi-parietal diameter, occipito-frontal diameter, abdominal circumference and femur length) manually for one fetus at one or several time points, view the results in the application (both z-scores / centiles and graphically), and directly download a *.pdf file of the results.

HOW TO PROCEED

1. Select manual entry mode

When you are on the home screen, click on the radio button “Enter data manually”. This will toggle from Data batch upload to Manual entry.

2. Enter data manually

On Windows

International Standards for Fetal Growth (v1.0.6257.25224)
About Language Help

Compare your fetal biometry to the INTERGROWTH-21®
International Standards for Fetal Growth:

Upload data or Enter data manually

Fetal size
Measurement set 1 (w 14/d 0)
Postmenstrual age (weeks + days)

Weeks:
14 15 16 17 18 19 20 21 22 23
24 25 26 27 28 29 30 31 32 33
34 35 36 37 38 39 40

Days:
0 1 2 3 4 5 6

Head circumference (mm):
Biparietal diameter (mm):
Occipitofrontal diameter (mm):
Abdominal circumference (mm):
Femur length (mm):

Add Measurement set Compare to standards >
Export

1. Select “Weeks”

2. Select “Days”

3. Enter at least one of the 5 measurements

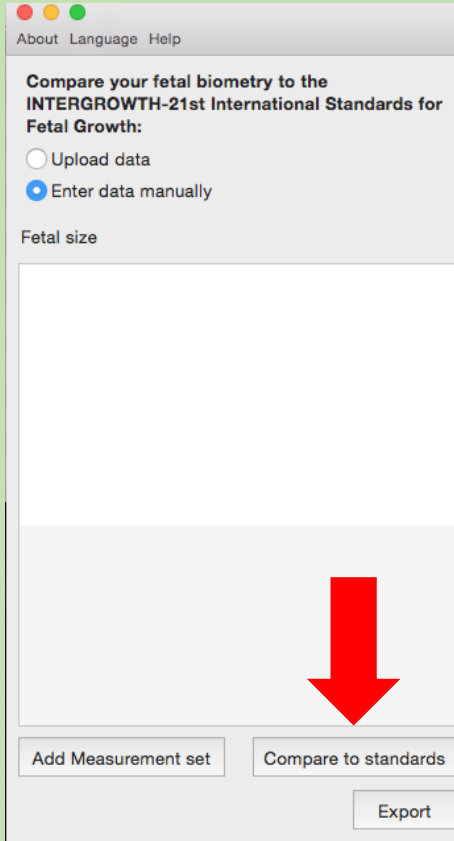
3.1 Click “Add Measurement set” to add dataset at other time point

4. Click “Compare to standards”

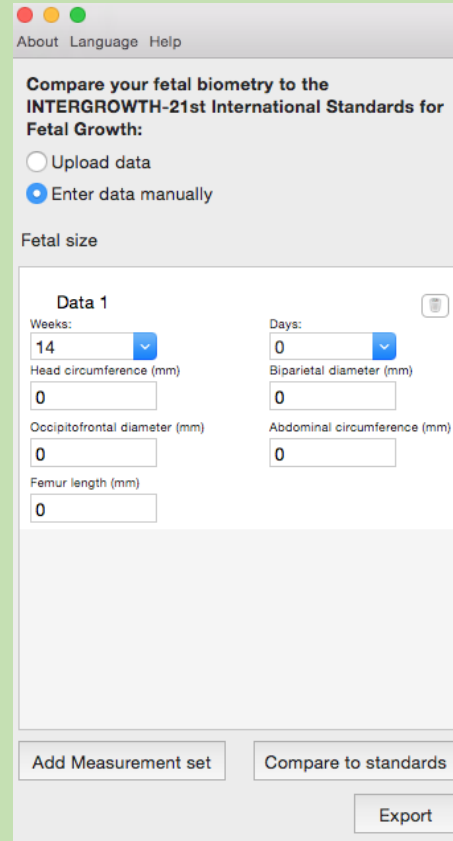
5. Click “Export” to save a *.pdf document of your data

On an Apple Mac

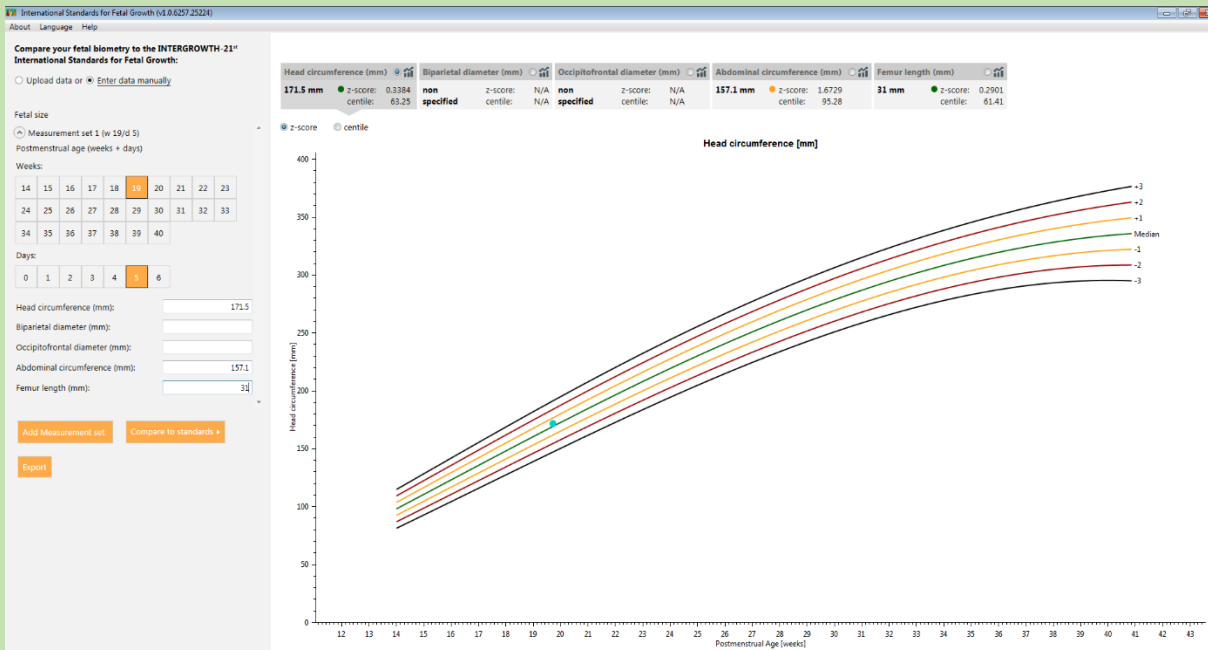
The left pane first appears blank. Select “Add Measurement set”.



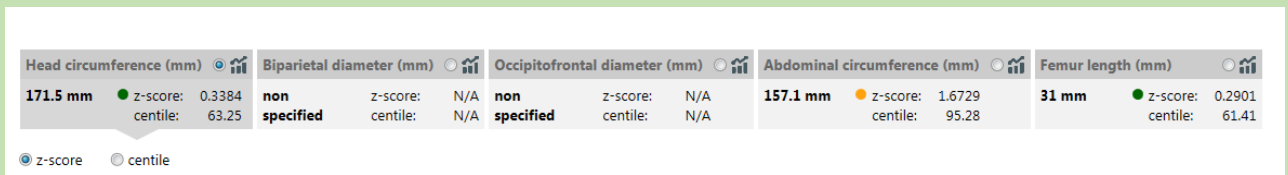
The space to enter information appears. Input data as previously.



3. Look at the results and graph



You can navigate between measurements by choosing their tabs and choose between z-score and centiles. You can also zoom in and out.



4. Enter data for more than one time point

You can enter measurements for more than 1 time point.

To proceed, simply click on the “Add Measurement set” button.

International Standards for Fetal Growth (v1.0.6257.25224)

Compare your fetal biometry to the INTERGROWTH-21st International Standards for Fetal Growth:

Upload data or Enter data manually

Fetal size

Measurement set 1 (w 14/d 0)

Postmenstrual age (weeks + days)

Weeks: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Days: 0 1 2 3 4 5 6

Head circumference (mm):

Biparietal diameter (mm):

Occipitofrontal diameter (mm):

Abdominal circumference (mm):

Femur length (mm):

Add Measurement set

Export

Space for a second set of measurements will appear.

International Standards for Fetal Growth (v1.0.6257.25224)

Compare your fetal biometry to the INTERGROWTH-21st International Standards for Fetal Growth:

Upload data or Enter data manually

Fetal size

Measurement set 1 (w 14/d 0)

Measurement set 2 (w 14/d 0)

Postmenstrual age (weeks + days)

Weeks: 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

Days: 0 1 2 3 4 5 6

Head circumference (mm):

Biparietal diameter (mm):

Occipitofrontal diameter (mm):

Abdominal circumference (mm):

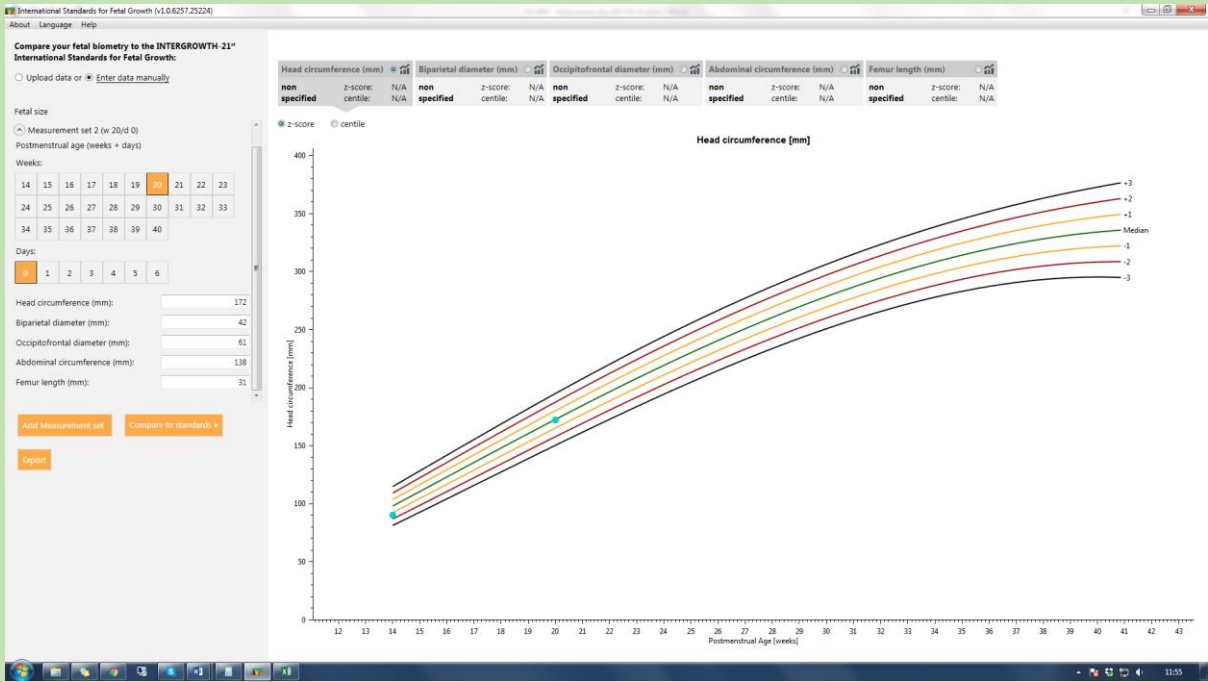
Femur length (mm):

Add Measurement set **Compare to standards**

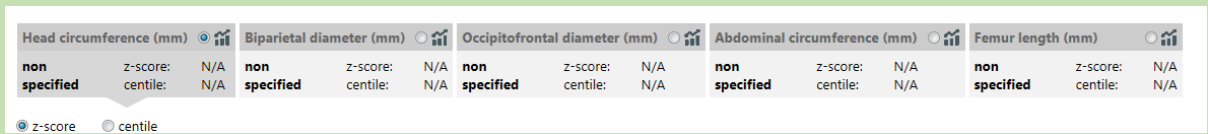
Export

Proceed as previously, enter the gestational age and one or several of the biometric data and click “Compare to standards”.

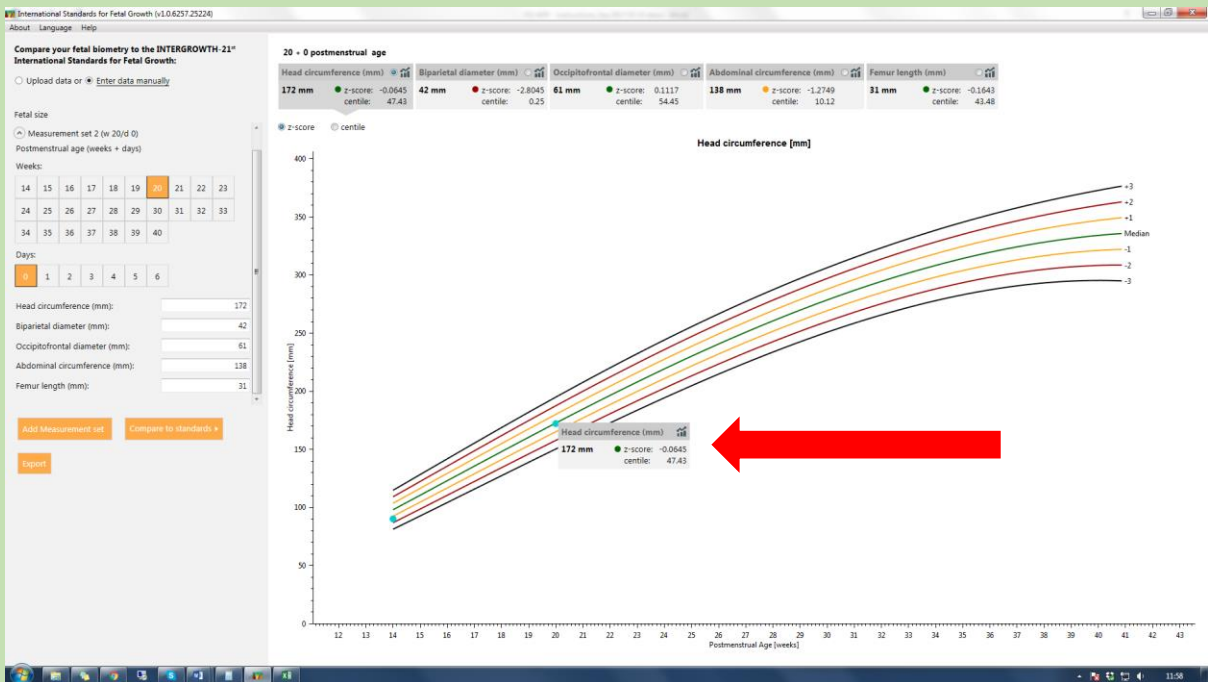
Repeat as many times as you have time points.



The upper tabs will not display the results until you click one of the points on the graph below



Then, an inset will appear on the graph showing the results and the upper tab will display all the results.



20 + 0 postmenstrual age

Head circumference (mm)	Biparietal diameter (mm)	Occipitofrontal diameter (mm)	Abdominal circumference (mm)	Femur length (mm)
172 mm ● z-score: -0.0645 centile: 47.43	42 mm ● z-score: -2.8045 centile: 0.25	61 mm ● z-score: 0.1117 centile: 54.45	138 mm ● z-score: -1.2749 centile: 10.12	31 mm ● z-score: -0.1643 centile: 43.48

z-score centile

5. Export and print the data

Click on “Export” to download automatically a *.pdf file containing the results and graphs for each measurement.

International Standards for Fetal Growth (v1.0.6257.25224)

About Language Help

Compare your fetal biometry to the INTERGROWTH-21[®] International Standards for Fetal Growth:

Upload data or Enter data manually

Fetal size

Measurement set 1 (w 14/d 0)

Postmenstrual age (weeks + days)

Weeks:

14	15	16	17	18	19	20	21	22	23
24	25	26	27	28	29	30	31	32	33
34	35	36	37	38	39	40			

Days:

0	1	2	3	4	5	6
---	---	---	---	---	---	---

Head circumference (mm):

Biparietal diameter (mm):

Occipitofrontal diameter (mm):

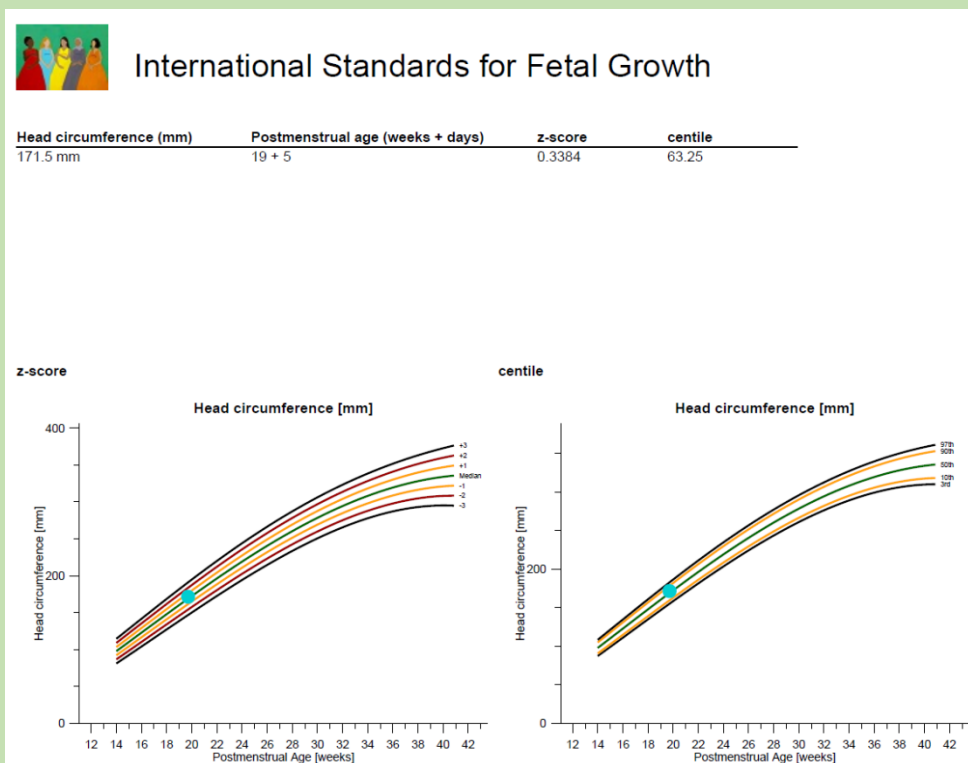
Abdominal circumference (mm):

Femur length (mm):

Add Measurement set Compare to standards ▶

Export

Example of output – here “Head circumference”:



HOW TO

4. TROUBLESHOOT

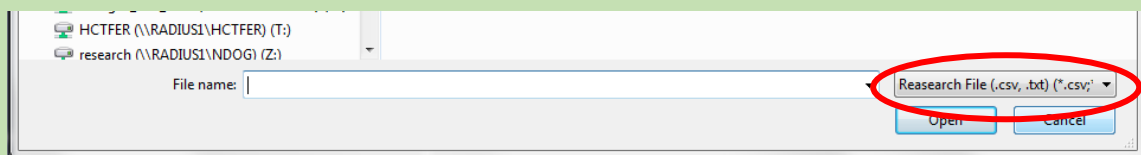
1. I cannot drag and drop my file. What should I do?

The application allows only *.csv files to be dragged and dropped directly. Files with a *.txt extension can only be uploaded through the “browse” function. First make sure that your data are in a *.csv or *.txt file.

Note that data in *.txt file should be separated by a comma or semicolon and not tab delimited.

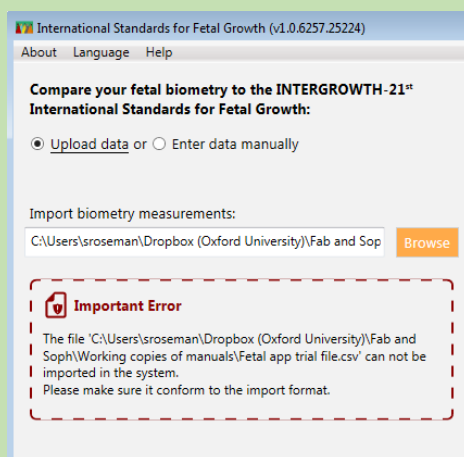
2. I cannot find my file. What should I do?

If when you try to upload a file using the “Browse” function, you cannot find your data file, make sure that your file is saved in a supported format, i.e. *.csv or *.txt



3. My file is in the correct format but when I upload it, I see an error message.

If you are certain that your file is in the correct format but when you upload your file, the application still displays the following error message:



Make sure your file is closed before trying to upload it. If not, close it and try again.

4. When I upload my files, the results are “N/A”?

If N/A appears, it may mean:

1. Gestational age is either missing or has not been entered in the correct format. Please refer to the “Prepare your data” section.

- The column has not been correctly labelled. Please refer to the “Prepare your data” section.
- The measurement is missing from your file

Example of screen:

- When GA (i.e. compulsory) information is missing or the data are present but not in the correct format (e.g. there are decimals in the values for GA, lines 2 and 10)
- When biometric data are missing (lines 3-7)

Child	Age (d)	Head circumference (mm)			Biparietal diameter (mm)			Occipitofrontal diameter (mm)			Abdominal circumference (mm)			Femur length (mm)		
		mm	z-score	centile	mm	z-score	centile	mm	z-score	centile	mm	z-score	centile	mm	z-score	centile
1	98	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	112	N/A	N/A	N/A	31.80	-2.0025	2.26	39.98	-1.2778	10.07	114.04	1.9998	97.72	22.51	1.8797	96.99
4	119	123.04	-1.8808	3.00	N/A	N/A	N/A	44.32	-1.2792	10.04	126.45	1.9994	97.72	25.66	1.8803	97.00
5	126	134.94	-1.8804	3.00	37.75	-1.9992	2.28	N/A	N/A	N/A	138.75	2.0003	97.73	28.73	1.8811	97.00
6	133	146.77	-1.8803	3.00	40.78	-2.0027	2.26	52.91	-1.2814	10.00	N/A	N/A	N/A	31.72	1.8812	97.00
7	140	158.49	-1.8803	3.00	43.85	-1.9996	2.28	57.14	-1.2782	10.06	162.98	1.9999	97.72	N/A	N/A	N/A
8	147	170.06	-1.8804	3.00	46.92	-2.0019	2.26	61.28	-1.2816	10.00	174.92	1.9995	97.72	37.47	1.8818	97.01
10	161	192.59	-1.8806	3.00	53.05	-2.0023	2.26	69.31	-1.2803	10.02	198.49	2.0005	97.73	42.92	1.8824	97.01
11	168	203.48	-1.8797	3.01	56.08	-2.0014	2.27	73.16	-1.2797	10.03	210.12	2.0002	97.73	45.53	1.8802	97.00
12	175	214.05	-1.8805	3.00	59.06	-2.0025	2.26	76.88	-1.2793	10.04	221.66	1.9996	97.72	48.07	1.8791	96.99

Example of screen when either a measurement has been omitted (here, head circumference) or your column has been incorrectly labelled (e.g. “HC” instead of “Headcircumference”)

Child	Age (d)	Head circumference (mm)			Biparietal diameter (mm)
		mm	z-score	centile	
07-001	98	N/A	N/A	N/A	87.00
name1	105	N/A	N/A	N/A	99.00
07-002	112	N/A	N/A	N/A	111.00
name2	119	N/A	N/A	N/A	123.00
07-003	126	N/A	N/A	N/A	134.00
name3	133	N/A	N/A	N/A	146.00
07-004	140	N/A	N/A	N/A	158.00
name4	147	N/A	N/A	N/A	170.00
07-005	154	N/A	N/A	N/A	181.00
name5	161	N/A	N/A	N/A	192.00
07-006	168	N/A	N/A	N/A	203.00
name6	175	N/A	N/A	N/A	214.00

5. I have tried everything and nothing seems to be working, what shall I do?

If you encounter further problems and cannot find a solution in this section, please contact us by email at intergrowth21st@tghn.org. Please state the nature of your problem(s) in detail (send screen shots if necessary) and include a sample or all of your data. We will check the data for you and give you feedback as soon as possible.