

Webinar: WorldPop Global 2 – Yearly High-Resolution Population Data in DHIS2

Transcript

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Björn Sandvik

Okay, I think we will start. Welcome everyone to today's webinar. It's a joint webinar between WorldPop and HISP in Oslo or DHIS2. We will focus on the new WorldPop Global 2 data set, which has now been added in DHIS2 across different tools. And we have joining us Professor Andy Tatum from WorldPop, which will present this data set, and also, Jessica Espey and a few others from WorldPop that will help out in the chats. And then from our side, it's Bruno, Karim, and me that will show you how to use this data in DHIS2. So, the shortly the agenda. So, WorldPop will start by introducing the new Global 2 dataset and then we will show you how to access and use this dataset across our tools in DHIS2. So, we will show you the Maps app, which is an easy way to just visualize and also, aggregate data on the fly. for your districts or units. And then we will show you the import export app where you can actually aggregate the data and import it to your DSS2 instance and then have it accessible across all the analytics apps and used in indicators and So, on. And then lastly, we will show you the new climate tools, which allows you to actually operate on the raw world of data and also, combine it with other data sets like different climate factors. So, you could, for example, detect people that are more vulnerable for air pollution or other factors. And then at the end, hopefully we'll have time for some questions and feedback. I would advise you to ask questions as we go along in the chat. And we are a little team here that we try to answer. And then we also, will have a session at the end with some questions and feedback. So, I will hand over to Andy, and to introduce the new global to well, both data sets. Thank you.

Andy Tatem

Great. Thank you, Björn. So, I am great sharing my screen. And yes, thank you all for joining. I'm gonna talk about the new Global 2 data that is, as Bjorn mentioned, is now within DHIS2. So, yeah, firstly, just an introduction to who we are and where we're coming from. We're a research group at the University of Southampton focused on geospatial integration methods for addressing demographic data gaps. Yeah, our mission is to undertake innovative research to empower decision makers, to harness the power of reliable, inclusive and accurate spatial data So, that people are not missing from decision making. I'm sure by joining this, you all understand and know the value of having small area population data across governance, across decision making, particularly in the health realm in terms of system planning, supply chain management, health metrics, SDGs, modelling diseases. But you may also, understand the challenges of getting this type of data. Small area population data can be, population data can be available, but it can also, be a coarse resolution and not at the level that we require for decision making. In many countries, it can be outdated, where lots of changes have occurred, have not been captured. Data may be available, but it may be incomplete, or there can be inaccuracies or whole population demographic groups missing from the data. So, at WorldPop,

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we try to address some of these challenges using geospatial data sets. So, this is starting from the situation of having Data like this of satellite imagery and nowadays there are tools, methods to be able to extract from those images things like buildings. Obviously it doesn't take us straight to population but gives us a good starting point for where people are likely to be residing. Groups like Google Research have taken this type of mapping to a new level to mapping across nearly the entire world at multiple time points. And in WorldPop, we gather those types of data and also, extract extra information from them to try and capture correlates of features that may relate to population distributions on the ground. So, that's extracting from those buildings, trying to understand which ones might be residential, which ones are non-residential, to process those buildings, to capture patterns in them, to identify different types of neighbourhoods. to bring in data sets on things like building damage when we're looking at disasters or conflict. bring in information on infrastructure that may relate to how populations distribute themselves in different parts of cities and the landscape. images of the earth at night that can give us information on whether an area is occupied or not. and then In some cases, bring in mobility data from the movement of mobile phones, from check-ins on smartphone apps. And the whole idea is to build up a picture of the landscape like this in the situation that we cannot go and count everybody through censuses, through surveys every single day in every single place. But we can bring together these types of data sets that can indicate where populations are likely to be on the landscape. And So, our stack of data looks a bit more like this. And it feeds into methods like this. So, you can see the geospatial covariates there. We bring in some form of population data. That may be a census, it may be a survey. And I'll go into more details on that soon. The other ingredient is some form of settlement data that tells us where people are not likely to be living. And then within those settlements, we use those geospatial covariates to try and understand why we might see higher population densities in other areas, in some areas than others. And the population data, of course, helps us test, validate, train those models. And these can be statistical or AI type machine learning models to be able to predict population estimates at a grid square scale. So, what we mean by the gridded data, this is the kind of data you may typically receive. This is part of Zambia coming from their census. What we mean by gridded data is really sharpening the lens So, that we have this smaller area picture of the population distribution. We zoom in, it can look like this. And what we're trying to do is estimate the number of people residing in each one of those 100 by 100 meter grid cells, as well as their age and sex breakdown. It doesn't mean that we are perfectly confident that these are accurate numbers, but the value comes in these types of data and being able to aggregate them and to be able to link them with other data sets, the flexibility, and you'll see that in the DHIS2 demonstrations. So, we produce 2 broad types of data set. I will briefly talk about the national data sets now, but mainly focus on the global ones which we're focusing on today. So, these national estimates are co-developed with decision makers for specific applications. And These are very much co-produced, co-developed with national statistics offices, ministries of health to meet specific needs. And this is work that we do in countries around the world to do things like produce estimates of national statistics that feed into decision making here in South Sudan. In Nigeria, the data feeds into vaccination micro plans. and then Sierra Leone here on catchment area planning policy for school infrastructure. But of course, we also, then produce these global data sets that we're going to talk about today. And this provides a much more consistent set of data methods and outputs for all countries, not tailored to specific decisions. They're multi-temporal and co-developed with global demographic and geospatial data providers. And these tend to provide the best for if we're looking for multi-country, multi-year analyses and a consistent set of data across years. So, you may be familiar, those who have

used DHIS2 with our Global One data. These cover each year from 2000 to 2020. They're age and sex structured and are in different platforms as well, HDX, ArcGIS, Living Atlas of the World. And by being open and available, they've fed into different types of applications. So, linking together with flood extents for disaster impacts, with conflict data to look at exposure to conflicts, with different types of health mapping data to get denominators and for disease control strategies. And of course, within DHIS2 in the Maps app. And to get some kind of ideas of how these types of data have been used in the past, we have these impact assessment reports done by an external company and also, these case studies. And of course, we'll share these slides afterwards if you want to explore the links. But the challenge is with these Global One data is that they are based on firstly outdated census data. The settlement mapping has been superseded by all kinds of technology advances. Similarly, the geospatial covariates have been improved and updated over the years. And then the mapping that is built on top of those is becoming outdated. So, this prompted us to, in September, to launch our new Global 2 data. This is what AI interpreted as our launch event. Actually, it was Jess, Maksym, and I stuck in a small cupboard with some people online. But this enabled us to present those new data sets. And I'll go through each component of these So, you can understand what goes in, what comes out, and the limitations of those data. If you want to find out more details, there's the release statement, there's a more accessible blog. and we'll share these afterwards. So, firstly, the inputs are the major inputs, the population data that goes into these global data sets. So, instead of just the 2010 round of censuses that Global One data had, we are now bringing in both the 2010 round and the 2020 round. So, this was a huge effort at assembling census data projections, official estimates, and in some cases, common operational data sets from UN agencies in conflict or disaster situations. That gave us two time points, sometimes three, sometimes just one, depending on the country. And then we worked with our social statistics and demography school at the University of Southampton to develop methods to then interpolate, project between those time points to give us a consistent 2010 to 2030 time period of set of data at these sub-national scales. These were adjusted to make sure the national totals matched with the world population prospects, 2024, the UN estimates. And then those data on their own give us quite interesting insights. When we start to look at those sub-national patterns, we see, of course, the proportion of population under 15 is decreasing generally while the elderly population is increasing. You see on the right there for particular look at somewhere like China in 2010 versus 2030, a huge growth in the number of elderly population. And just looking within Africa at sub-national scales, we see on this animation, each one of these dots is a sub-national unit and moving away from the youths towards the working age and elderly populations. over the 15-year time period here. So, that's the input data in terms of the populations. Then we bring in the master grid settlement covariates that enables us to go to the grid square scale and bring more consistency in the outputs. First component of this is settlement data. So, we're bringing together multi-year global settlement data that comes from satellite imagery data sets produced by the Joint Research Centre of the European Commission, the German Space Agency. And on top of this, we bring in single year building footprint data. So, you can see in some places the building footprint data adds to areas that were not captured in some of these multi-year data sets. So, that we link those in to get a more comprehensive global set of settlement data. We then adapt and update the built settlement growth model that we used for Global One to produce a 15-year time period here of settlement growth. It's one of the important bases, obviously, of our population estimation work at the grid square scale. And then the set of covariates as well have been updated, and these are all openly available. There's a paper there. There's a set of 7300 by 100 meter grid square scale data sets that are freely and

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openly available on our website from things like built up surface, built up volume, distance to inland water, and land cover metrics. So, that's their input settlement data and covariates, and these feed into our machine learning disaggregation model. So, we are starting with our population counts at that administrative unit level that we've assembled and built a time series of across the 15-year period. And linking with that, we have firstly our built settlement mask that helps us identify which areas we're going to model into, which areas are the areas where people are residing, and which are the areas where people are not residing. And then within those areas, we have a set of covariates. So, this is things like building footprint counts. It's things like land cover classification. It's things like satellite nighttime lights of the Earth. And as I mentioned, there are 73 or more of these geospatial covariate data sets that help us go from this administrative unit scale down to the grid square predicted estimates at 100 by 100 meter grid cells. So, to do that, it's the same kind of model as we used for Global One, it's a random forest machine learning model. We've updated the disaggregation package and improved it. For those who want to run it themselves, there is now a QGIS plugin and a video here. You can learn how to use it. There are a whole set of stats as well that come with this. I don't need to go into too much detail here, but it tells us things about how well we were able to explain the variance in the population data in different countries. see how well we did compared to where we had recent census data versus older census data, and that those plots tell us which were the most important geospatial data sets. Often the building data sets are now the most important for us predicting population distributions. And finally, this produces our time series from 2015 to 2030, annual 100 meter estimates. And So, I can show you now some of the differences from Global 1. So, here's Global 1, our built settlement mask mapped in black on top of satellite imagery. This is just a rural area of Afghanistan. So, that's Global 1. Global 2, because of the use of building footprint data and updated settlement masks, data coming from updated satellite imagery, we're able to capture a lot more of the built settlement. And that then helps us improve our population mapping. So, this is, again, another rural area. And you can see in the bottom there on Global One, we only mapped 1 grid square in green there as population. But in actual fact, you can quite clearly see from satellite imagery that there are areas where we should be mapping population that are residential areas. And in Global 2, because of the improved data sets and the improved modelling, we're capturing those much more accurately. We're also, capturing urban areas much better. This is Niamey in Niger. Global 1, we didn't have very good input data. The output looks a bit fuzzy. And Global 2, that looks a lot better. We're capturing much more of the rural settlements around as well as the densities within those urban areas. And also, by bringing in data that classifies buildings by residential, non-residential, commercial, industrial. Whereas in Global 1, we were mapping people in parkland, in fields in some cases. In Global 2, we're doing a much better job at reducing those population numbers in commercial areas and not mapping people into parkland. And the value of having multiple census inputs as well. So, in Global 1, this is an area in the age of Romania where you can see a settlement in the right-hand side of the maps. And Global 1, that shoots up to very high growth between 2015 and 2020. Whereas in Global 2, the population roughly stays the same. If we map it out, that's what things look like in terms of the estimates over the years. In reality, by having that 2021 census data, we are constraining the populations to much more realistic estimates and not predicting explosive growth. So, the value of having those two census inputs should give us a much more reliable time series. So, ultimately, this is what the data looks like, in this case for Khartoum in Sudan, mapping across the 15-year time period. There are Google Earth Engine apps where you can play and explore with these types of data. So, again, we'll share these slides afterwards So, you can go to those links. And we've since produced other types of outputs. So,

we've implemented the degree of urbanization metric that's been signed off by the UN Statistics Commission. by level one and level 2 degrees of urbanization. So, that's available to download. And we're also, in the process of this project of producing projections from 2025 up to 2100 under different SSP scenarios. Future growth. So, there's early version data sets there and newly updated ones will come soon. So, just to finish off, there are, of course, limitations that you should be aware of in using these data sets. They are what we say of top-down disaggregations. So, we're taking census or estimates at admin unit scale and disaggregating those to grid squares. So, if there are any uncertainties, errors in those initial estimates, they feed through into the gridded outputs. Each country is modelled separately, So, it leads to some inconsistencies between countries depending on inputs. It does mean that we also, on the positive side, capture local variations within those countries. Those population projections can be highly uncertain, especially at sub-national scales for countries that don't have a recent census. And I'd recommend you look at the Global 2 release statement and read our page here on choosing the right data for you So, that you can understand what are the limitations when you're using these types of data. You can access them in a whole range of different ways, as well as through DHIS2, of course. There's our data hub, spatial temporal asset catalogues, FTP site, our new API is active now, and obviously there's HDX and Google Earth Engine I've mentioned. So, just what's happening next, we should soon be finalizing its demographics portal to help you access all of the input population data, as well as an AI assistant that enables you with different languages, different natural language processing ways to access those data and query it. And we'll be updating these global data sets annually. So, the next phase, we're looking at working out ways to integrate our bottom-up estimates co-developed with countries. bringing in new census data as well as new forms of mapping from things like informal settlements to try and capture urban populations better. We're continuing to update our learning resources. So, there's again the link there. There's training manuals, book of methods, different training methods programs that are in there. And we will be soon initiating just like the DHIS2 community, community of practice for WorldPop. I hope you'll be able to join. So, I'll finish there. Acknowledge the big team behind all of this work. And just also, highlight that if you have feedback and would like to influence what we do next, then we have this open survey and we'll share that around to all. Thank you. Over to Bjorn again.

Bruno Raimbault

Yeah, actually, that'd be me taking over. Yeah, thank you, Andy. Very nice to get all the details behind data sets. And here, So, I'm going to take it over to present a little bit. So, following up the agenda, just confirming It's going over, right? OK, So, here we I'll start showing the different ways we have this wonderful global tool data set integrated into the HIS tool. So, I'll be presenting how we can access it into the maps app and via the import export app. And then I'll hand over to Karim, who will show us how you can use the WorldPop dataset in climate tools. So, before starting, I want to refresh our memories, or maybe some people might not be familiar with the process of getting a gridded data set aggregated to organization unit. So, as Andy explained, the global data set is 100 meter grid with each grid cell containing population count. And, to this is a global data set, and to extract it to our organization unit in the HIS2, we need to use the organization unit boundaries. We overlap them with data set, extract overlapping cells. And then we use statistical methods. So, typically here we would sum the value associated with each cell to obtain the total population count for our organization unit. So, I wanted to remind us of this process because it gives you an idea of what are the requirements to be able to use a WorldPop data set. So, the first thing is that we need access to the World Pop Global 2 data. And currently

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in maps and import-export app, we use Google Earth Engine platform to access this data set. So, that means you need a key to access it. And the second requirement is you need to have organisation; you need boundaries available. So, there must be a polygon geometries. So, that's the second thing. And if you want to import the data in your system, not just visualize it, you should consider installing a metadata package. And that gives you also, a configuration to get the data values in your system. So, as we mentioned already, after the webinar, we'll share all the material and So, this guides to help you go through all these steps in case you need it or you are not, you don't already have a key or the geometries. And obviously, you can always reach us on the community of practice to get some help. So, now I'm going to start with the demo. And here we start with the Maps app. So. Here, one way to access the population data set is to go here, add a layer, and you should have enabled, if you have a Google Ascending key, you should have access to this population option. And here you can switch between the two main data sets we're focusing on here is a global tool for total population and Global 2 by age group. So, here for this first example, I'm going to go with total population. Here you can set the area statistics. So, if you go back to this small schema I presented, it's a statistical method we use to produce the aggregate. So, Here, typically, we want to see the sum to get a total population count within our unit. And we can also, be interested in mean. That would give us like some idea of the population density. Next, if we go to period, So, here is a very nice thing about this new Global 2 data set is now we have access to all these time points. And typically, I would be interested in population data for the current year. And I can visualize the population data for the entire country. So, here you will recognize our demo Sierra Leone database. And for example, I can focus on board district. And I can add a layer. And here we are. We can see the population gridded data set directly into the Maps app. And I can, for example, change the background layer. I'm going to change a little bit the opacity. And I can zoom in. And for example, see how this seems like a big city, and I can actually see how it overlaps with the city. Some other thing that I can do is inspect by clicking directly on the map. I can get organization unit population here and the estimated density. I can go back to my layer and for example, let's have a look at Chiefdom. So, now I get the same but divided by Chiefdom. I can also, inspect total population and I can see in the data table for the values for every single of my chiefdoms can even download the data as a GeoJSON, which is a typical geospatial format. And this data will come with a population code for all the Chiefdom. So, this is just a first example. I already prepared another example now looking into the population age group. So, what I've done is I've selected, say, under one year of age population age group for both male and female, and added them to the data set. And then I overlapped it with some health indicators. So, here's the ANC first visit in the last three months. So, I can see, and this is at a facility level. So, here I can see where the visits are happening, compare it with the population. I can go in details. But one limitation here is I cannot really create new indicators using this WorldPop data. And that's one way to occur to overcome this limitation is to actually import the population data as data values. And that's what I'm going to show you now with the Import/Export app. So, here I can see Import/Export app open. And we'll use the Earth Engine import feature. But before doing that, you need to have the proper metadata to import this data. So, we've developed a metadata package. So, you can find it in our GitHub repository. It will be shared along with the resources for the webinar. So, you have this metadata JSON. which has everything that you need from user groups, category option, data elements, to test and import the data. You also, have in the documentation design and installation guide, which helps you go through all the process of importing, give you links to the different things you need to set up. So, I recommend you go through it if you need to use metadata package. So, here, I've already imported some metadata. So, I used this metadata

import to do so. And so, I have everything ready to actually import WorldPop data. So, that's how we see Earth Engine Import works. You can select just like before our total population, our population by age group. So, here for this demonstration, I'm just going to focus on the age group, but it works the same for total population. So, here you can select the year of interest. You have to import years independently. And then here you can select the organization unit you want to import. We recommend importing separately different levels, and that's the way the data elements are set up. So, that's one small tweak you would have to do to the metadata package is check the levels used, the aggregate levels using the data elements. All the instructions are available in the installation guide, so, you should refer to that. Why we recommend importing levels different separately is, well, importing at each level is because you might have gaps, for example, in lower levels or inaccuracies. And if you only import the lowest level, then it means these gaps and inaccuracies would propagate to a higher level when you aggregate. Whereas if you import at multiple levels, the aggregation are independent and we have a bit more control over quality. So, this is my selection here. I'm going to, for the demonstration, I'm just going to go with district to make it a bit quicker. But it, depending on your, the number of organization units, it should work. It can work with a large number of district or organization units. And here, finally, I have to select my data elements to which I'm going to import. So, this is coming from the metadata package. And here, I'm going to select population by sex and age groups. Because the metadata package is properly configured, I get age groups in so, data matching with my category option combination from my data element, and I can preview the import. So, this is actually sending the organization unit to Google Earth Engine and retrieving the values. So, here I see actually everything imported already, but I can see how the value gets updated. And I can navigate also, organization unit to see the details and also, sex age group. And then I can actually start importing. So, I'm going back to the top of the page and we can see, we can follow the progress. One thing to remember is, yeah, like when you import new data values, you need to refresh your analytics table before you can actually analyse the data. And let me show you quickly how it looks when you have the data in your analytics app. So, for example, here I put up the population total at national level for all the different years I've imported. And then there's also, the breakdown by all the sex and age groups. So, for example, female, 0 to 1, and then 1 to 4. Everything that's available is shown here. So, this is at a national level where I can also, show at any district or children level where I've imported the data. So, just to show you the example. So, now I'm down to bore district. So, this is all the data that's available. And this population data can live along other population data you might already have in your system. And for example, here I have already total population, which is my official data set. And then I can use, for example, the WorldPop Global 2 totals to compare. So, this is obviously demo data, just for illustration purposes. But that's something you might be interested in doing, especially maybe at lower levels and with different time periods. One other thing that you can do is now you can use-- So, obviously, you can use these data elements in your indicators. But you can also, use-- the calculation feature in the Data Visualizer app to create your calculation on the fly. So, for example, here I'm using the ANC first visit data element and I'm dividing it. So, that's a count of ANC first visit and I'm dividing it by under one year of age. population count. And this way I'm creating a kind of a coverage indicator, but with world pop data denominator. So, this is one, obviously it's a percentage. And the last thing is you can also, use the population data in maps, but this time with a semantic layer. here. So, for example, here I just created a timeline where I can see how the population changes between 2020 and 2030 or is expected to change. So, that's it for me. I'm handing it over to Karim to present us climate tools. Thank you.

Karim Bahqat

OK, thank you. We'll share screen. So, you should be able to see my screen. So, I'm going to present on how you can work with World Population Data in DHIS2 climate tools. So, this is a new initiative that we released in January. So, this is an open source collaborative toolkit for accessing, working with, and importing climate and geospatial data into DHIS2. So, this is a Python-based programming. It's based on Python programming language. So, you do have to be a developer to work with the climate tools. One of the benefits of working with climate tools is that it does not rely on Google Earth Engine. So, you can access climate data and population data by going direct to the data providers and not via Google Earth Engine. So, if you are a developer and you want to get started, there's this button you can follow. It will tell you how to install the toolkit. Once you have installed it, you will have a ready to go environment in your Python, yeah, a Python environment that will have all the tools that you need to get started. So, on this climate tools website that we have, we also, have a number of guides and tutorials for how to do common workflows, working with climate and health data. And this includes how to work with population data from WorldPop. So, you can search up here in the right, upper right to get guides and tutorials relating to populations. So, for instance, We have a guide for how you can download population data straight from the WorldPop website. And this is done with just a few lines of code. You can download population data for a country and a number of years with just a few, this short code snippet. So, that's, yeah, and then you can inspect and see what the data looks like with this. And that's using the Global 2 product. We also, have this tutorial that goes through the full pipeline for how you can import population data into DHIS2. So, it goes through how to connect to DHIS2, downloading the world population data, and then aggregating the population data to the DHIS2 health districts or organization units. And then finally, importing that into DHIS2. And finally, we also, have another tutorial that shows you how you can do population-weighted aggregation. So, just to show what that is, I'm going to show you what climate tools looks like in practice. So, here I have a script on my computer, a Python script. I've set up the climate tools, installed it based on the instructions. And then I'm going to show how to do population weighted precipitation. So, in a few simple steps. So, the step one is connecting to DHS 2, which is straightforward. Step 2, you can get the health districts from DHS 2, which looks like this for Sierra Leone. Step 3, we can easily download data. So, we can download the precipitation data from Chirps 3 and population data here. from WorldPop. So, and again, this is going straight to the data sources, and you don't need Google Earth Engine for this. And then step 4 is calculating the population weighted precipitation. So, what this means is that you take, you look at precipitation for a particular day, and you can see different clusters of precipitation. You then compare this with the population where the people are actually located in the country. This is from using the data from WorldPop. And then with some calculations, you can get the population weighted precipitation. So, what this means is that, yeah, only the areas where that a lot of people were, that had precipitation with also, a lot of people. It's the ones that are going to show up in this final map. So, not as much emphasis on this northern region, even though there was some precipitation appeared to, but this southern region lights up much stronger because there was also, more population down there. So, that's, and So, this is only possible where we're working, one of the things you can do working directly with the gridded world pop population data and climate data and bringing them together. So, I think that is, yeah, So, those are some examples of what you can do with population world pop data and when using DHIS2 climate tools. So, with that, I'm going to. Yeah, we're going to the questions and feedback, So, I'll bring it back to Björn.

Björn Sandvik

Yeah. Thanks all for the nice presentations. We will send you all the material we have showed you in an e-mail to all the registrars, all that have been registering after this webinar. Also, feel free to add more questions in the chat. We have some more time. I would just mention also, that we have the community of practice, So, please, you can go on and ask questions there. I've also, provided a link to the WorldPop website. And I would also, like to mention that we have this cooperation with Andy for a long time. I just checked that we added the first world pop data in 2016, 10 years ago in DHIS2. And we just met; you see a picture here for our going sledding. Back in January, we had a workshop and we also, planned to meet again and have a joint session at the annual conference in Oslo in June, which is also, online. And then we plan also, to focus more on practical use cases. This webinar has been more on the data set and how to access it in DHIS2. And then we will plan to focus more on the actual use cases in this annual conference. So, please keep a note on that. I saw that there was a few questions about like accessing this. So, we have this dependency on the Google Earth Engine for the import-export map and the Maps app. If you already have this set up, if you already can access population layers or the climate layers we have in the Maps app, you're all good to go. So, there is no new key for this. So, the first thing you could check is you have to go into the Maps app and see if you can access these layers and then you are good to go. I'm also, wondering, Bruno, if we have some information on the worst version, like which version on DHIS2 do you need to be on to access these features?

Bruno Raimbault

Right. So, for import/export app, it's from 241. And for the maps app, it's available since 240.

Björn Sandvik

Good. I'm wondering also, if you, Andy, have seen some questions in the chat that we could lift up.

Andy Tatem

Yeah, I was just replying to the general one about is WorldPop model highly dependent on country census? And the answer is it depends on the country. So, in our global data, what we've been talking about today. It's an assembly of census data in the situation where there has been a 2010 census and a 2020 census, but in some cases, obviously a country hasn't had a census for a long time. So, there we bring in projections from places like US Census Bureau, we bring in where there's conflict situations or disaster, we bring in data, data from common operational data sets on population statistics that UNFPA and other UN agencies produce. So, I would recommend that you look into the, if you're really interested in a specific country, to look into the documentation that's we will share afterwards and is also, on our website that gives the input sources. And also, to consider in a country that has not had a census for a long time to consider some of our bespoke population estimates where we are producing those in collaboration with the Ministry of Health or our National Statistics Office and using things like health campaign data or listings from a recent household survey where we know that the census is likely to be a very unreliable source. So, I think, yeah, dig into the data to understand what the sources are. The answer to that. And I think there was a question about the climate data supporting weather prediction precision. That may be more of a question for you, Pion.

Björn Sandvik

Yeah, so. We have this big climate and health project and that is also, partly what we try to cover with the climate tools because we can always make generic apps where we can try to make things easy. But then the things you can do with these data set, it's So, wide, there is So, many possibilities. So, that is what we have tried with the climate tools is to make this data available, but also, all the tools that are rounder in the ecosystem available and rather to create good practices and workflows for how to do this. And this is also, meant to be a sharing platform. So, hopefully others can contribute. And we are already working closely around climate and health in 15 countries. So, I will post a link, but I will advise you to check climate at DHIS2.org for how we are working on combining these data sets together. And especially we are focusing on prediction modelling to see where there might be future outbreaks and how many people might be affected. And this population data plays a crucial role in this work.

Bruno Raimbault

There was also, a question on catchment areas for facility level population estimates. So, I'm just going to mention we have some resources on this that we are going to share. So, after the webinar, there's a very nice DHIS2 app from Crosscut. I think it's called Microplanning. And it helps you generate catchment areas for your facilities. And then you can use these geometries to import population data. So, at administrative level, that might be something you're interested into. And that's one of the unique possibility open by this type of graded population dataset.

Björn Sandvik

Okay, I just shared a link to the Climate and Health Project for DHIS2. As mentioned, we will share all the material and the recording of this webinar with you. So, you will have all the links. Feel free to reach out to us if there are any more questions. And thank to all the presenters and all the people joining. Yes, and then hopefully we'll see many of you for the DHIS2 annual conference, either in Oslo or online. Thank you all.

Bruno Raimbault

Thank you everyone. Thank you.

Karim Bahqat

Thank you.