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HDX Community:

The following report and data attachments were completed in partial fulfillment of Public Health coursework in "Medical Geography," for spring 2017, at Drew University. The report explores the present acute food security situation in Yemen, and presents updated demographic estimates from several sources, including WorldPop, LandScan, and the Gridded Population of the World (GPW, version 4).

Data attachments include population estimates for Administrative Areas, by IPC phase for 2017. Please refer to the metadata for more details. For questions about this work, or the Spatial Data Center at Drew University, please refer to the contact information [here](#).

Many thanks,

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Yemen

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Summary

As of March 2017, Yemen is currently one of the most severely affected food insecure countries in the world, with about half the population facing Integrated Phase Classification (IPC) Phase 3 of crisis, or IPC Phase 4 of acute food insecurity. Those affected by IPC Phase 4 face high risks of mortality. It is predicted that by May 2017, there could be populations facing IPC Phase 5, or catastrophe.¹ Problems including ongoing conflict, road blockades, lack of access to healthcare, and poor sanitation/access to clean water all factor into excess vulnerability in populations like internally displaced persons (IDPs). Invasion by the Houthi forces on Yemen's northern border in 2004 was successful in gaining control of the capital Sana'a, allowing the rebels to move further south and seize more territory. Invasion of Sana'a deepened political instability. As a result, IDPs have been forced from their homes into IDP camps, shelters, or with relatives who are many times also food insecure themselves.¹ Many of these vulnerable populations are concentrated in the larger western cities of Sana'a, Ta'izz, and Hajjah. Stemming from the invasions, conflicts, and fighting are also blockades of essential roads and ports seen all throughout Yemen.² For an import-dependent country, this has been detrimental in terms of availability and accessibility to food, fuel, and medicines. Hospital facilities do not have sufficient supplies to treat the ill, hurt, or wounded, and have been coerced into both rationing care and purchasing such necessities from the black market. Additionally, fighting and airstrikes have illegally targeted hospitals, killing not only patients but also staff, resulting in the closure of over half the facilities.³ Impaired access to clean water and sanitation has resulted in an officially declared cholera outbreak at the end of 2016,⁴ which is presently compounded by lack of payment to sanitation workers.⁴

Background

In Yemen there exist two major players in food insecurity: conflict and the corresponding health crisis. Political factors include the ongoing conflict over political control against the Houthi forces.^{5,6} In 2006, a sharp rise in violence led to internal displacement. Following the civil uprisings in Tunisia in 2014, militant groups organized significant resistance in Yemen. Despite peace initiatives, the fighting and attacks continue and various forces against the Houthi rebels are appearing throughout the country. As a result of the rebel invasions, access to roads have declined, making them either difficult to access or completely closed. This is due to destroyed bridges, clearance difficulties, month-long delays, and increased security measures.³ Depending on 90% of its fuel, medicine, and food from imports, this has created detrimental impacts on Yemen.¹ Increased blockades and inspections have caused fuel and food prices to spike and become scarce, producing both a lack of accessibility and lack of availability.

From a population of 27.4 million Yemenis, approximately 14.1 million are food insecure and 3.11 million of those insecure are IDPs, or internally displaced persons. About ten million Yemenis are classified as IPC Phase 3 food insecure, of which about two million are IPC Phase 4 crisis and facing mortality.⁷ It has been predicted that by the end of May 2017, populations in conflict-affected areas needing most assistance may be IPC Phase 5 facing catastrophe.¹ Most of the population is concentrated in the western portion of Yemen, predominantly in the cities of Sana'a, Hajjah, and Ta'izz, which also happen to have the greatest IDP populations and IDP camps. These IDPs live either with families or in rental shelters, which poses burdens on host families due to the limited resources, resulting from blockades and fighting. IDPs have been displaced from their homes due to high levels of airstrikes, shelling, and fighting, and it is assumed that at such constant rates of conflict, the number of IDPs will not decrease by May 2017. As a result, IDPs have lost their means to livelihoods and are struggling to afford food. This has furthermore lead to increasing malnutrition and mortality rates.⁸

The second major factor impinging on Yemen's food security is the limitation to healthcare and clean water. About 14.8 million people do not have access to the most basic of healthcare, and about 14.5 million people, or about half the population, do not have

¹ USAID, 2017. "Significant Populations Continue to Face Large Gaps in Their Basic Food Needs." FEWS NET <http://www.fews.net/east-africa/yemen/food-security-outlook/october-2016>

² Logistics Cluster <http://www.logcluster.org/map/yemen-access-constraints-map-23-october-2016>

³ "The Fight for Yemen." *Film*, PBS Frontline, 7 April 2015, <http://www.pbs.org/wgbh/frontline/film/fight-for-yemen/>.

⁴ Gladstone, R. 2017 "Cholera Compounds Suffering in a Yemen Torn by War." New York Times 9 May 2017. URL: <http://www.houstonchronicle.com/local/gray-matters/article/Out-of-environmental-injustice-art-11133230.php>

⁵ Al-Khalidi, S. 2017. "WFP had says 'race against time' under way to prevent Yemen famine." Thomas Reuters Foundation News. 13 March 2017. URL: <http://news.trust.org/item/20170313181039-3p7o4/>

⁶ Agence France-Presse. 2017. "World faces worst humanitarian crisis since WWII: UN." 12 March 2017. URL: <http://www.sbs.com.au/news/article/2017/03/12/world-faces-worst-humanitarian-crisis-wwii-un>

⁷ UN-OCHA 2017 Humanitarian Response Plan http://reliefweb.int/sites/reliefweb.int/files/resources/2017_HRP_YEMEN.pdf

⁸ USAID, 2017. "Significant Populations Continue to Face Large Gaps in Their Basic Food Needs." FEWS NET <http://www.fews.net/east-africa/yemen/food-security-outlook/october-2016>

access or need assistance in receiving clean water.⁹ Additionally, a cholera outbreak was declared in 2016, affecting the health and nutrition of not only adults but children as well. Only 45% of health facilities are reported to still be standing and functioning.⁵ Hospitals are being targeted by rebels, bombed, and shut down, which is against international law. Healthcare workers have died and many have stopped working. Some hospitals do not even have enough oxygen to give their patients when performing surgeries or operations.¹⁰ Many such necessities must be rationed, and with a non-existent stable central government, funding is cut and many of these instruments and items must be obtained from the black market. Since October 2016, thirteen healthcare workers have been killed and 31 have been injured.⁴

Combatting the rebel forces has led to ordinary Yemeni civilians leaving their livelihoods and pursuing dangerous battle. Several groups are present on the frontlines, many of which do not even agree with each other's ideologies. They still fight side-by-side, however, because they share a common enemy: the Houthi rebel forces. These groups may include civilians fighting for Yemen, pro-government forces, or members of Al Qaeda. Saudi Arabia has led a coalition against the forces as well, but their airstrikes have killed over 6,000 people and injured over 35,000.¹¹

Demographics

Tables 1 and 2 identify administrative areas and their predicted populations based on three different data sources: WorldPop¹², Gridded Population of the World (GPW, version 4)¹³, and LandScan, as obtained through Population Explorer.¹⁴ Both WorldPop and GPW are adjusted to match UN population totals and projections.¹⁵ There are substantive differences across the data sources, particularly for Al Hudaydah, Hajjah and Sana'a. In the first two cases, GPW exceeds WorldPop by around one million; whereas, WorldPop estimates approach values one million higher than GPW for Sana'a.

Table 1. Population Estimates from Three Gridded Population Data Sources, by Medium Term IPC Acute Food Insecurity Phase 4: Emergency (June – September 2017)

Administrative Name	IPC Near Term	IPC Medium Term	LandScan 2015	WorldPop 2010	WorldPop 2015	WorldPop 2020	GPW 2010	GPW 2015	GPW 2020
Abyan	4	4	592,077	339,440	380,384	425,710	629,342	714,035	796,751
Aden	4	4	799,293	1,082,421	1,130,119	1,264,785	900,935	1,036,406	1,172,564
Al Bayda	4	4	779,482	415,157	464,516	519,868	828,795	933,053	1,033,075
Al Dhale'e	4	4	638,489	280,591	316,039	353,699	676,928	764,827	849,870
Al Hudaydah	3	4	2,931,101	2,185,878	2,442,968	2,734,074	3,053,027	3,459,813	3,856,063
Hajjah	4	4	1,999,854	1,259,381	1,414,023	1,582,482	2,145,955	2,417,389	2,678,114
Lahj	4	4	980,692	661,617	737,995	825,935	1,046,459	1,183,344	1,316,043
Sa'ada	4	4	940,124	587,529	657,346	735,490	1,000,641	1,128,133	1,250,807
Sana'a	3	4	1,244,701	2,388,308	2,568,417	2,874,471	1,415,615	1,605,712	1,791,994
Shabwah	4	4	637,310	413,042	460,854	515,770	676,887	763,926	847,918
Taizz	4	4	3,234,054	3,564,610	3,985,780	4,460,728	3,404,763	3,837,108	4,252,957
Total, IPC (4):			14,777,177	13,177,974	14,558,441	16,293,011	15,779,348	17,843,746	19,846,155

⁹ UN-OCHA 2017 Humanitarian Response Plan http://reliefweb.int/sites/reliefweb.int/files/resources/2017_HRP_YEMEN.pdf

¹⁰ "The Fight for Yemen." *Film*, PBS Frontline, 7 April 2015, <http://www.pbs.org/wgbh/frontline/film/fight-for-yemen/>.

¹¹ BBC News. "Yemen crisis: Who is fighting whom?" BBC News, 28 March 2017, <http://www.bbc.com/news/world-middle-east-29319423>. Accessed 30 March 2017.

¹² WorldPop. 2013. AsiaPop, 2010. Downloaded May 2, 2017, URL http://www.worldpop.org.uk/data/data_sources/

¹³ Center for International Earth Science Information Network - CIESIN - Columbia University. 2016. Gridded Population of the World, Version 4 (GPWv4): Population Density Adjusted to Match 2015 Revision UN WPP Country Totals. Palisades, NY: NASA Socioeconomic Data and Applications Center (SEDAC). <http://dx.doi.org/10.7927/H4HX19NJ>. Accessed 2 May 2017.

¹⁴ USAID, FEWS NET, 2017. Population Explorer Application. <http://populationexplorer.com> Accessed 2 May 2017

¹⁵ The complete estimates for administrative areas (Adm1 and Adm2) are included in the HDX Upload.

Figure 1 illustrates the change in IPC phase from near term to medium term, providing accompanying population estimates, based on LandScan totals, made available through Population Explorer.

IPC 2.0 Acute Food Insecurity Phase, and Demographic Indicators

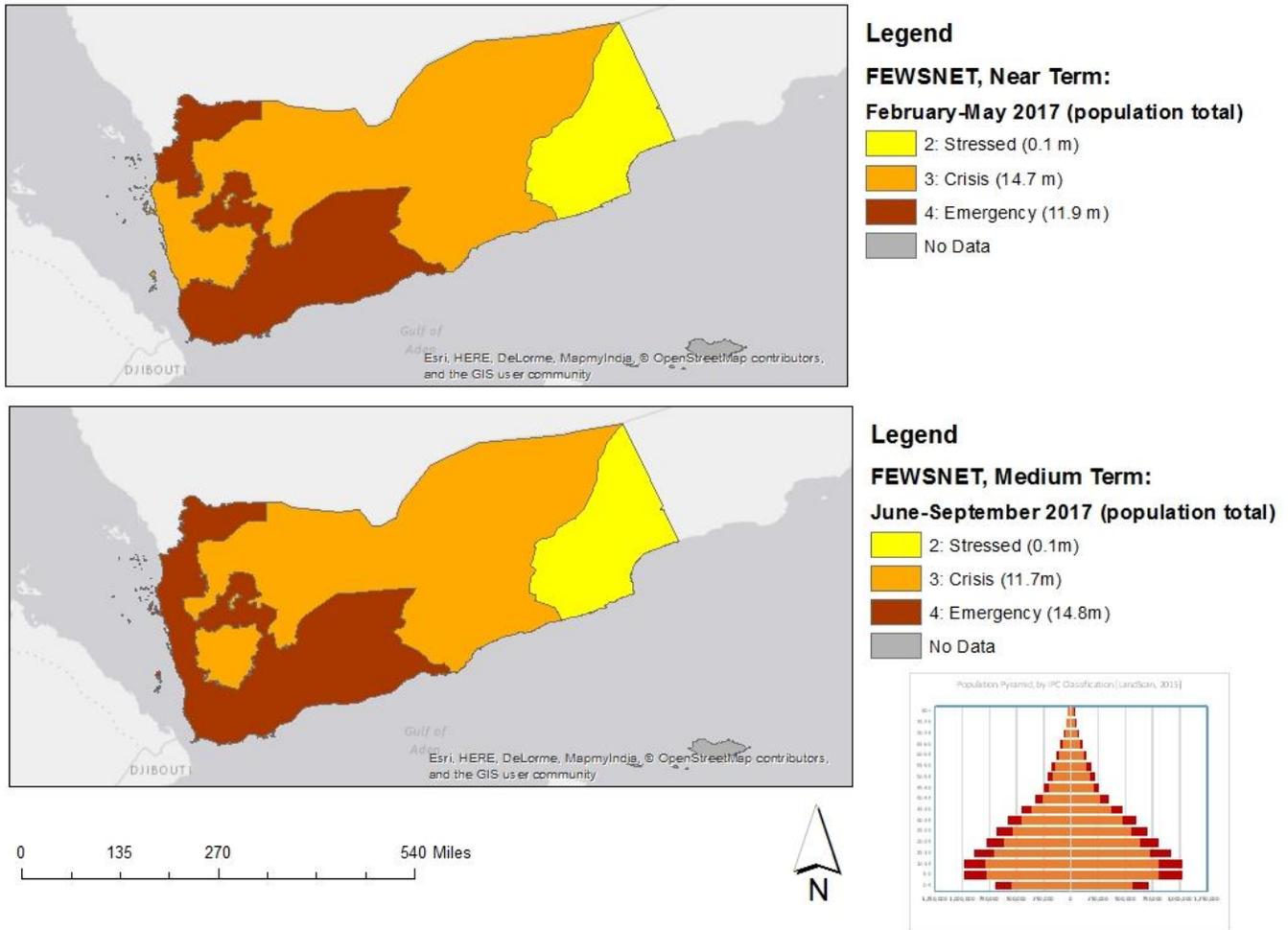


Figure 1. IPC Classifications for Near and Medium Term (2017) with Population Totals from Population Explorer

Figure 2 provides a visual of Yemen and where the highest populations of IDPs reside. The eastern region of the country has the lowest relative numbers of IDPs ranging from 1,000 to 15,000 individual per governorates. The highest levels of IDPs are seen on the western-most side of the country with reported numbers of nearly half a million IDPs in Hajjah.¹⁶ This trend could have a correlation with the large cities of Sana’s, Ta’izz, and Hajjah, and the political unrest occurring specifically in these cities with larger populations.

¹⁶ Reported as 405,924, with 43,266 returnees to Hajjah, as of March 2017.

Al-khameri, Mustafa Shakib, 2017. Yemen: IDP Interactive Dashboard. Accessed: 2 May 2017,

http://public.tableau.com/views/DemographicDynamicNew/YemenIDPInteractiveMapping?:embed=y&:showVizHome=no&:display_count=y&:display_static_image=y&:bootstrapWhenNotified=true#!%2Fpublish-confirm

IDPs for March 2017 - TFPM Database

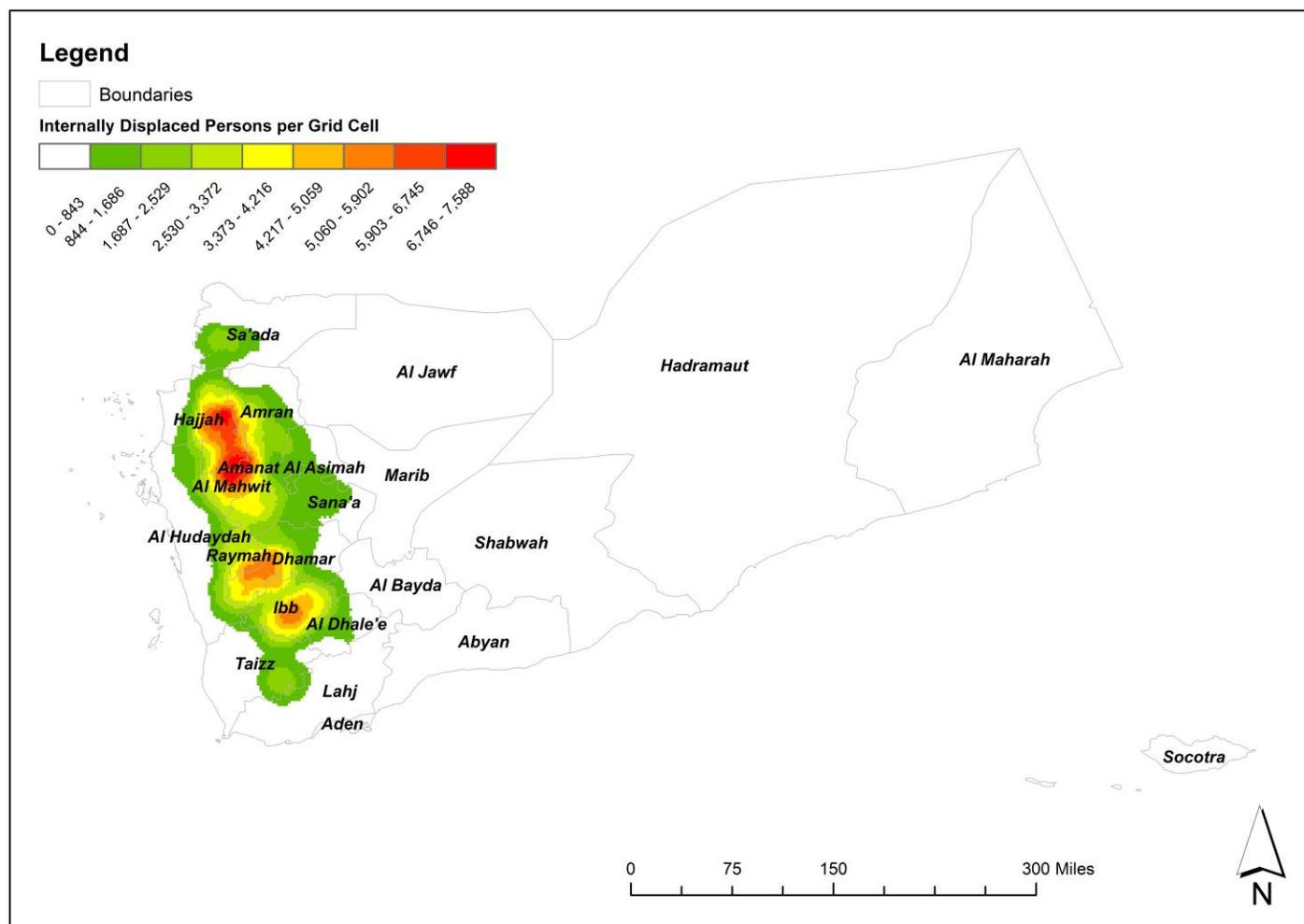


Figure 2. Density of Internally Displaced Persons, March 2017. Source: TFPM Database

Recommendations

In a recently published article for the World Peace Foundation, de Waal wrote about Saudi Arabia's coalitions fighting the Houthi forces and how "their strategy has been economic warfare: a near-total blockade and the destruction of infrastructure including roads, markets and the port of Hudaidah. In a poor country dependent upon food imports, these are faminogenic acts—but there is no international law that prohibits them."¹⁷

Central to creating food security within Yemen, a strong central government must be re-established, and departments and ministries must be integrated in order to target the factors affecting food insecurity: conflict, blockades, and healthcare. Similarly, road and port blockades must be reversed so that availability and accessibility to food can be re-established.^{18,19} International law must be upheld prohibiting stronger countries from taking advantage of poor, unstable countries such as Yemen as well as standing against strikes against hospitals and other healthcare facilities, which targets innocent civilians and workers.

¹⁷ De Waal World Peace Foundation <http://sites.tufts.edu/reinventingpeace/2017/02/28/on-the-significance-of-the-declaration-of-famine-in-south-sudan/>

¹⁸ Ryan, M. 2017. "U.S. plan to help Yemenis obtain humanitarian aid falters, amid growing food crisis." The Washington Post, 15 March 2017. URL: https://www.washingtonpost.com/news/checkpoint/wp/2017/03/15/u-s-plan-to-help-yemenis-obtain-humanitarian-aid-falters-amid-growing-food-crisis/?utm_term=.4ff9e39288e3

¹⁹ Bearak, M. and L. Karkils. 2017. "Starving to death: Wars in four countries have left 20 million people on the brink." Washington Post. 11 April 2017. URL: https://www.washingtonpost.com/graphics/world/2017-famines/?utm_term=.d339504d625d&wpisrc=nl_most-draw10&wpm=1

The UN-OCHA states one of their objectives for 2017 is “supporting and preserving services and institutions essential to immediate humanitarian action and the promotion of livelihoods and resilience.”²⁰ Their 2017 Yemen Humanitarian Response Plan outlines that two billion dollars are being allocated to food, health, and nutrition to target and aid about 12 million people. Such a step is essential to promoting the right to adequate food and proper healthcare for all Yemenis.

²⁰UN-OCHA 2017 Humanitarian Response Plan http://reliefweb.int/sites/reliefweb.int/files/resources/2017_HRP_YEMEN.pdf