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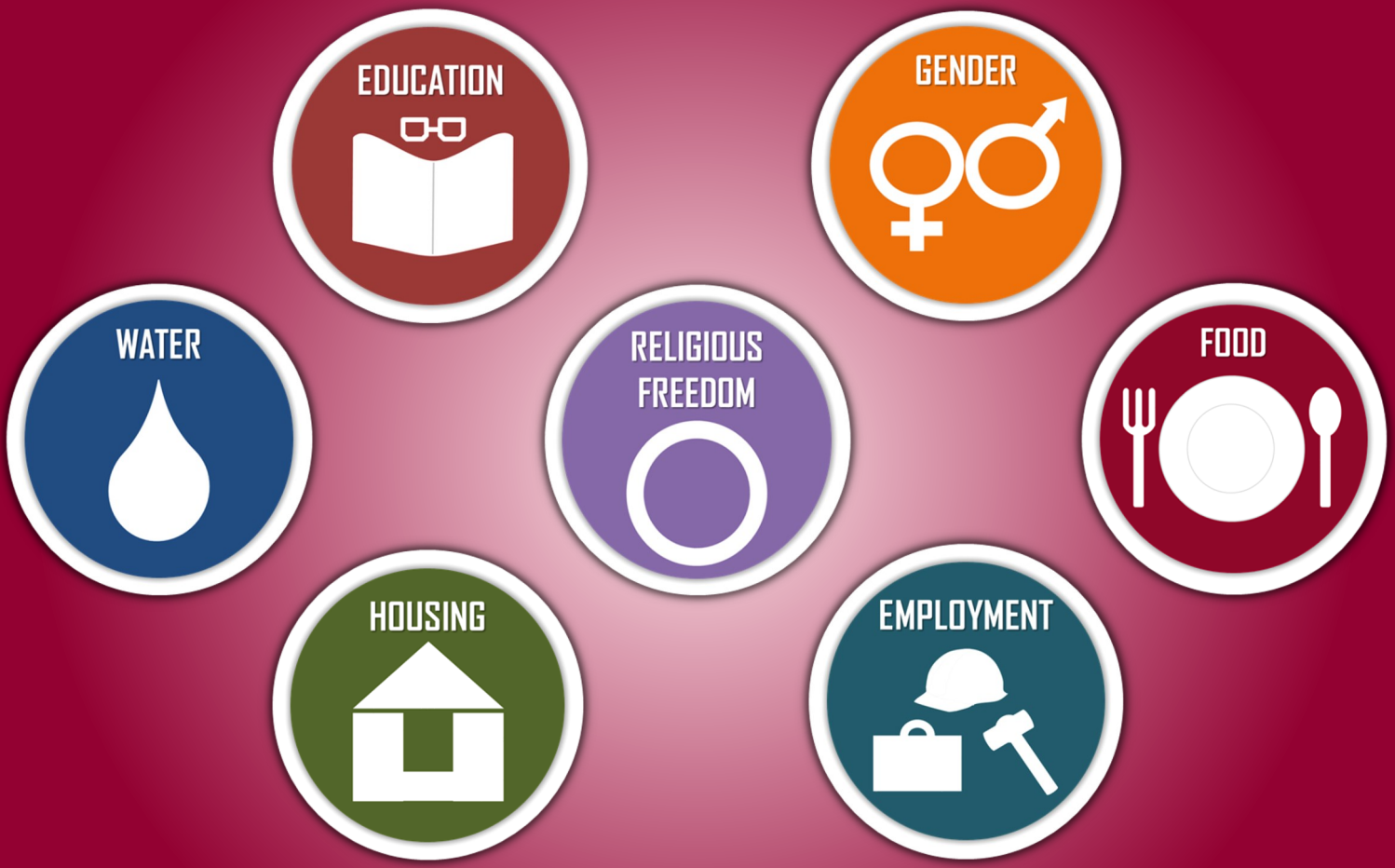

FORDHAM'S POPE FRANCIS GLOBAL POVERTY INDEX

“To enable these real men and women to escape from extreme poverty, we must allow them to be dignified agents of their own destiny.

At the same time, government leaders must do everything possible to ensure that all can have the minimum spiritual and material means needed to live in dignity.

In practical terms, this absolute minimum has three names: lodging, labour, and land; and one spiritual name: spiritual freedom, which includes religious freedom, the right to education and other civil rights.”

Photo Credit: UN Photo / Cia Pak

About the Logo:

The logo illustrates the seven primary elements that are considered in the Fordham Francis Index. The four elements on the left side represent the Material Well-being components: Water, Food, Housing and Employment. The remaining three on the right side comprise the Spiritual Wellbeing components: Education, Gender Equity, and Religious Freedom.

Acknowledgements

The Fordham Francis Index would not exist without the invitation of the US branch of the Vatican Foundation *Centesimus Annus Pro Pontifice*. The Foundation's request for us to present our ideas at their 2016 international conference on "Pope Francis' Call for Escaping Poverty" is what led to the creation of this index. We are indebted to many of the participants at that conference for their comments. We are also deeply appreciative of the detailed comments we received from Fr. Elias D. Mallon, S.A, Ph.D. of the Catholic Near East Welfare Association, Ms. Liliana Carvajal, Monitoring Specialist, Research and Policy, UNICEF HQ, and Prof. Robert Brent of Fordham University's Economics Department. We are also very thankful for the official sponsorship and financial support of Fordham University's Graduate Program in International Political Economy and Development (IPED). Of course all remaining errors and omissions are solely the responsibility of the authors.

2017

Fordham University
Graduate Program in International Political Economy and Development

FORDHAM'S POPE FRANCIS GLOBAL POVERTY INDEX

ABSTRACT: The Fordham Francis Index (FFI) is a multidimensional measure of international poverty inspired by Pope Francis' address to the United Nations General Assembly in 2015. Pope Francis identified four basic human needs — water, food, housing, and employment — as essential for a minimal level of material wellbeing. Francis also identified religious freedom, education, and other civil rights such as gender equity as the basic human needs essential for a minimal level of spiritual wellbeing. The FFI identifies appropriate measures for each of Pope Francis' seven basic human needs and then aggregates them into a material wellbeing index, a spiritual wellbeing index, and an overall Fordham Francis Index (FFI). The FFI's indicators are closely related to many of the UN's Sustainable Development Goals (SDG's). To date we have documented a strong relationship between the FFI indicators and reduced poverty, better nutrition and improved health and sanitation. The FFI is innovative in two ways. First, when compared to other measures of poverty, it has a stronger emphasis on basic human needs and favors outcomes that benefit the marginalized. Second, besides including indicators of material wellbeing, it also includes indicators of spiritual wellbeing. These spiritual indicators, such as education and the civil rights of religious freedom and gender equity, may play an important role in empowering the poor to be champions of their own destinies.

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FOREWORD

I am pleased to present to our readers the 2017 issue of *Fordham University's Pope Francis Global Poverty Index.*. The Fordham Francis Index (FFI) was inspired by Pope Francis' address to the United Nations General Assembly in 2015. In his address the Pope identified four basic human needs as essential for a minimal level of material wellbeing. They were water, food, housing, and employment. Francis also identified religious freedom, education, and other civil rights such as gender equity as the basic human needs essential for a minimal level of spiritual wellbeing.

The Fordham Francis Index (FFI) is a simple multidimensional poverty measure. It relies on only seven indicators. This report identifies appropriate statistics to measure each of Pope Francis' seven basic human needs and then aggregates them into a material wellbeing index, a spiritual wellbeing index, and an overall Fordham Francis Index.

The FFI is broadly indicative of development trends in the fight against global poverty. Its indicators are related to many of the UN's Sustainable Development Goals (SDG's). For example, the FFI is closely related to reduced poverty, better nutrition and improved health and sanitation.

The Fordham Francis Index (FFI) is innovative in two very important ways. First, when compared to other measures of poverty such as per capita GDP or the Human Development Index, the FFI has a stronger emphasis on basic human needs and

Source: USAID Photo Gallery

therefore gives more weight to outcomes that benefit the poor and the marginalized. Second, besides including indicators of material wellbeing, it also includes indicators of spiritual wellbeing. These spiritual indicators, such as education and the civil rights of religious freedom and gender equity, may play an important role in empowering the poor to be, in the words of Pope Francis, "dignified agents of their own destinies."

The development of a simple technical instrument of verification like the Fordham Francis Index (FFI) can also empower civil society organizations who want to promote integral human development. They can use the FFI to monitor and evaluate the efforts of national and international governmental agencies as

well as other national and international actors. Do their policies and programs benefit the poor? Do their policies and programs empower the marginal to champion their own destinies?

We welcome your comments and critiques. Please contact us at your convenience.

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Guest Commentary

*This paper was delivered by Fr. Elias D. Mallon, S.A., PhD on September 23, 2016 in response to the presentation of the Pope Francis' Global Poverty Index during the conference "**Pope Francis' Call for Escaping Poverty**" at Fordham University's Lincoln Center Campus. Fr. Mallon is External Affairs Officer of the Catholic Near East Welfare Association (CNEWA) and specializes on Roman Catholic/ Christian-Muslim dialogue.*

I would like to thank CAPP-USA (*Centesimus Annus pro Pontifice*) and Fordham University for inviting me to be part of this panel today. I am honored to be here today. I have been engaged in interreligious dialogue and more specifically the Christian-Muslim dialogue for almost forty years now. In addition, I have worked for United Nations NGOs for the past ten years. In that time I have been involved with issues of interreligious cooperation, defamation of religion and freedom of religion[1] or, as the UN somewhat cryptically calls it, Freedom of Religion or Belief, without delineating what the difference might be.

My topic today is Pope Francis' call for escaping poverty and freedom of religion as one of the indicators for that escape. In the last twenty years freedom of religion has become a major topic for theology and international law. The very frequency with which the topic appears can make it seem like a rather straightforward issue. I would like to suggest that such is most definitely not the case and that Pope Francis is aware of that. In the very short time I have, I would like to indicate how complex and difficult the topic is and to show how Pope Francis deals with it.

An awareness of the complexity of the problem is important if we are to prevent overly facile solutions which, in fact, might promote the freedom of one religion while curtailing that of another. Due to time limitations I can only list points. For those interested in a more in depth study of the problem I refer to Anat Scolnicov, *The Right to Religious Freedom in International Law: Between Group Rights and Individual Rights* (London: Routledge, 2011) and Malcolm D. Evans, Peter Petkoff and Julian Rivers, edd., *The Changing Nature of Religious Rights under International Law* (Oxford: Oxford University Press. 2015).

I mentioned earlier the UN rather unsuccessful attempt to treat defamation of religion. One of the main reasons for the failure is that there is no universal understanding of religion as an (legal) entity perhaps because such a univocal understanding is impossible. Christians are accustomed to a religion that is built on a quasi-corporate model: there is a CEO, a corporate headquarters, a line of command and very often an articulated policy in the terms of theology, canon law etc. What most fail to realize is that the Christian model is not the normal one. In fact, most other world religions are built on a much more "horizontal" model. Thus Christians find it frustrating and "not normal" when there is no one who "speaks for Judaism, Islam, Buddhism, Hinduism, to say nothing of indigenous religions." It therefore is not always clear on a very basic level where the right to freedom of religion resides (primarily?): in the individual and/or the institution, where such exists?

Another major change in the world of religion is the

pluralistic society. If in the past religions existed in relative isolation from each other and enjoyed a cultural, linguistic, political and legal hegemony that is increasingly no longer the case. In very many parts of the world the major religions of the planet live side by side. In some places they live together as equals, in others as friendly or not so friendly competitors. Although in some parts of the world there is the resurgence of what I call the "denominational state," that is generally not the case. What this means is that in a religiously pluralistic society, the right to freedom of religion can sometimes result in a conflict of rights. It seems that European legal scholars are more aware of this problem than are US scholars. It is, nevertheless, not an academic or theoretical problem. The rights of one religious group can and have impinged on the rights of another and this presents a well-nigh insoluble problem. The problem becomes acute when one religious group claims the right to call upon the coercive power of the state to enforce its theology or moral code.

Even where things appear quite clear, it is often misleading. No one — at least publically — would deny that ISIS engages in an egregious, totally illegal form of religious bigotry and persecution. Religious and non-religious people around the world — including the vast majority of Muslims — find ISIS morally and religiously abhorrent. And that is by any standard true. However, ISIS has been extremely careful to find "theological" justification for its atrocities. For example, when ISIS burned Mutah al-Kaseabeh, the downed Jordanian pilot, alive, there was an outcry in the Muslim theological community that burning alive was forbidden in Islamic law. ISIS had, nevertheless, researched traditional Islamic sources and developed a response in the form of a *fetwa* from their Authority for Research and Fetwas as to why it was permitted also from Islamic law.[2] With no attempt to justify the criminal barbarism of ISIS, it is important to note that they believe they take pains to justify their barbarities through traditional Islamic categories and are, therefore, exercising their religion. The crucial question then becomes: at what point, therefore, does a group's freedom to exercise its religion end or be constrained? And who decides that?

In dealing with Pope Francis' use of freedom of religion I believe we can see several important things. First it is based on *Dignitatis Humanae*, The Declaration on Religious Liberty of the Second Vatican Council (7 December 1965), which may be one of the most important documents of the Council. With *Dignitatis Humanae* Pope Francis speaks of the right to religious freedom of *all people*. Often in discussions about religious freedom the question comes into my head "Whose religious freedom?" All too often the answer is the religious freedom of the group to which the speaker belongs. That is not the case with Pope Francis. He speaks about the freedom of everyone.

For the sake of brevity I would like to highlight a few examples of the attitude of Pope Francis towards freedom of religion. In his address to the conference on "International Religious Freedom and the Global Clash of Values" (20 June 2014) Pope Francis recognizes religious freedom as "a fundamental human right which reflects the highest human dignity, the ability to seek the truth and conform to it...." The pope also recognizes that "every human being is a 'seeker' of the truth of his own origin and his own destiny." Questions "intrinsic to one's intimate essence...are questions of religion and...require religious freedom."

The second document which I would like to look at is *Laudato si'*. In the opening of the encyclical, which is a profoundly religious, Catholic document, Pope Francis addresses his letter "to every living person on

this planet".[3] The encyclical was written with consultation from believers and thinkers from many churches and faiths. As such it underlines Francis' belief that religion and religious people are called to serve the common good. Francis' call for a responsible use of the earth's goods in *Laudato si'* is a ***religious challenge to all religions***. The integral ecology and spirituality called for by Francis are not narrowly defined denominational goals. They are challenges to all for the good of all.

That Francis is not thinking of what has traditionally been ascribed to a denominationally specific piety is clear in his address to "leaders of other religions and other Christian denominations," delivered on 21 September 2014 at the Catholic University of Our Lady of Good Counsel" in Tirana, Albania. The pope spoke of the return of religious freedom to Albania and noted: "With this religious freedom has also come the possibility for every person to offer, according to his own religious convictions, a positive contribution; firstly, to the moral reconstruction of the country and then, subsequently, to the economic reconstruction."

In a most extraordinary way, Pope Francis describes how he understands religious freedom and, equally important, the purpose of religious freedom:

> "...religious freedom is a shared space...an atmosphere of respect and cooperation that must be built with everyone's participation, even those who have no religious convictions. Allow me to outline two attitudes which can be especially helpful in the advancement of this fundamental freedom.
>
> The first attitude is that of regarding every man and woman, even those of different religious traditions, not as rivals, less still enemies, but rather as brothers and sisters. When a person is secure is his or her own beliefs, there is no need to impose or put pressure on others: there is a conviction that truth has its own power of attraction.
>
> The second attitude which fosters the promotion of religious freedom is the work done in the service of the common good. Whenever adherence to a specific religious tradition gives birth to service that shows conviction and concern for the whole of society without making distinctions, then there too exists an authentic and mature living out of religious freedom."

Far from being utopian, romantic or narrowly denominational, Pope Francis' understanding of freedom of religion is universal; it applies to every human being. It is also geared to practical action — promoting the common good of all.

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[1]Cf. Elias D. Mallon, PhD, "Interreligiöser Dialog und die UNO: Möglichkeiten und Grenzen des interreligiösen Dialogs in der Pluralität der an der UNO akkreditierten NGO's" Konferenz der deutscsprachigen Pastoraltheologen und –theologinnen, Augburg, 2009; urn:nbn:de:hbz:6-97419522391.

[2]http://www.aymennjawad.org/2015/02/islamic-state-justification-for-burning-alive
http://www.memrijttm.org/isis-issues-fatwa-to-justify-burning-of-jordanian-pilot.html

[3]To some extent this highlights how Pope Francis would treat the tension that sometimes arises between the concepts "the common good" and "the universal destination of goods." The moral reconstruction of a country would refer to is overall program of working for the universal good of all, while the economic reconstruction of a country would highlight the just and adequate distribution of goods.

Pope Francis' Primary Indicators

Pope Francis identified seven basic human needs that are essential for a minimal level of both material and spiritual wellbeing. Francis sees **water**, **food**, **housing**, and **employment** as essential for material wellbeing. He also sees **education**, **religious freedom**, and other civil rights such as **gender equity** as essential for spiritual wellbeing.

The researchers at Fordham carefully evaluated various statistics that could be appropriate measures for each of these seven basic human needs. Our selection criteria followed a robust yet straight forward approach. Initially, we wanted a statistic that best captured Pope Francis' views of each of these seven basic human needs. Next we needed the data to be easily accessible so that our results could be reproduced anywhere in the world. An important concern was geographical coverage and obtaining as many observations as possible. Finally, we were concerned about the consistency, reliability and credibility of the data and sought to use data collected and distributed by respected international organizations such as the United Nations and World Bank. In the following sections you will receive a more detailed definition, identification and justification for each of our seven chosen measures. It is worth mentioning that in this report, we managed to overcome caveats in the previous year's report by identifying and updating our measures of gender equity and adequate housing in order to improve on the robustness of the FFI going forward.

Once we selected a statistical measure of a primary indicator, we mapped the data to better visualize geographical disparities around the world. We also documented the ten countries who most lacked each particular basic human need. Finally, we used simple linear regression techniques to empirically test the relationships between our FFI indicators and six targets associated with various UN Sustainable Development Goals (SDG's). The targets we examined were: poverty, infant mortality, maternal mortality, sanitation, income equality, and corruption.

Through this process we were able to document that these seven primary indicators are indeed correlated with the aforementioned targets of the UN's Sustainable Development Goals. In future iterations of this report we hope to eventually regress all seven of the primary indicators selected with all 169 targets within the UN Sustainable Development Goals (SDGs) framework.

Material Wellbeing Indicators

In this section we will review each of Pope Francis' indicators of material wellbeing: water, food, housing and employment respectively. We will describe the choice of statistics we used to measure each indicator, identify those areas of the world most lacking these basic material needs, and then relate the successful provision of these basic material needs to the achievement of some of the UN's Sustainable Development Goals.

WATER

Pope Francis includes access to drinking water as a basic human need because it is fundamental to sustaining human life. He suggests that it is not enough for the marginalized to have access to any type of water. The water should be clean and accessible enough to be obtained when needed, and without undue burden. We chose *the percentage of a population using an improved drinking water source* as the best statistic to measure Pope Francis' understanding of the basic human need to access clean water.

This statistic measures a population's access to all improved drinking water sources. It includes piped water on private premises (piped household water connection located inside the user's dwelling, plot or yard), and other public improved drinking water sources (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collections) that are nearby to the end-user. For 2014, the WHO/UNICEF Joint Monitoring Programme (JMP) for water and sanitation database provided us with data covering 197 countries.

International Distribution of Needs

The map in Figure 1 represents the data collected and the dark blue areas reveals concentrations of water deprivation across Sub Saharan Africa in particular, with sporadic deprivation throughout the Middle East and Asia. Table 1 lists the ten countries whose populations have the least access to improved water sources. Seven out of ten of these countries are in Africa.

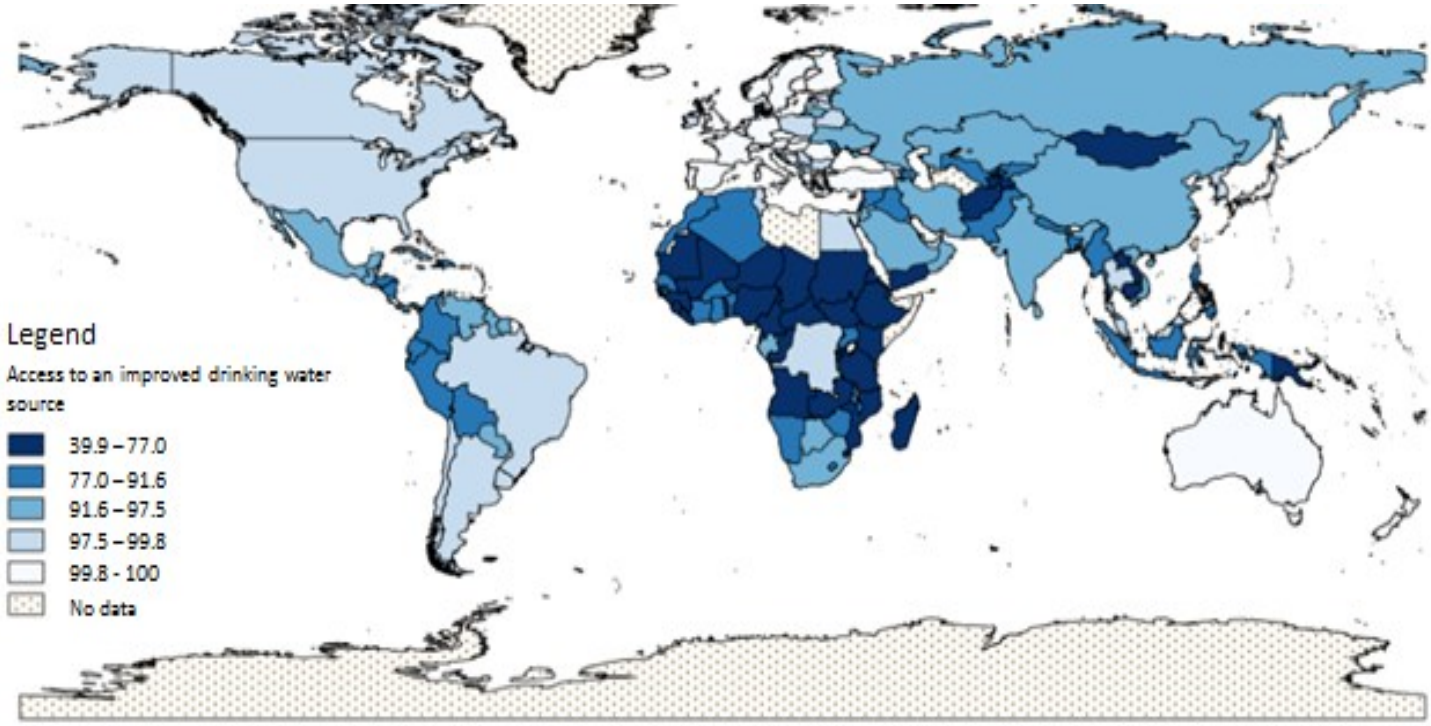
UN's Sustainable Development Goals

The importance of human access to improved drinking water sources is easy to demonstrate empirically. For example, regarding the UN's First Sustainable Development Goal of **No Poverty,** we were able to find a significant statistical relationship between access to water and the percentage of the population above the poverty line. Regarding the third UN Goal of **Good Health**, we were able to determine that access to improved water sources is significantly related to reductions in both infant and maternal mortality rates. And, as might be expected, we found that access to improved water sources is also clearly correlated to achieving the sixth Sustainable Development Goal of **Clean Water and Sanitation.** Finally, regarding the sixteenth goal of **Peace, Justice and Strong Institutions,** we were able to demonstrate a strong statistical relationship between access to water and a reduction in perceived corruption.

Table 1: Top ten most deprived nations with respect to access to an improved drinking water source

Rank	Country	% Access (2014)
1	Papua New Guinea	39.95
2	Equatorial Guinea	47.80
3	Angola	48.60
4	Madagascar	50.60
5	Chad	50.79
6	Mozambique	50.94
7	Yemen	54.90
8	Afghanistan	55.17
9	Ethiopia	55.42
10	Tanzania	55.50

Figure 1: Map of percentage of a population using an improved drinking water source (2014)



(*See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)*

FOOD

Pope Francis' selection of access to adequate food as another primary indicator is based on the belief that every individual has a right to life. In 2013, he called the inexplicable presence of hunger and food insecurity endured by one billion people a global scandal. Thus the measure chosen should be able to explicitly capture the number of individuals regularly experiencing food insecurity.

We chose the *prevalence of undernourishment* as the best statistic to measure access to food. Although the prevalence of undernourishment covers fewer countries than other metrics such as the average dietary supply adequacy measure, it was chosen because it captures food insecurity across an entire population. Moreover, it is more nuanced insofar as it places emphasis on individual energy requirements, as opposed to average food intake.

The prevalence of undernourishment is defined as the percentage of a population who are continuously unable to consume enough food to meet dietary energy requirements. The data for prevalence of undernourishment is obtained from the UN Food and Agriculture Organization (FAO). The FAO reports the data as three-year averages and is available every two years for 169 countries.

International Distribution of Need

Using averaged data over a three-year period from 2013-2015, the dark red areas of the map in Figure 2 reveals the prevalence of undernourishment across Sub-Saharan Africa, Asia, and parts of Latin America.. Table 2 indicates that eight of the ten countries that most lack adequate nourishment are in Sub Sahara Africa.

UN Sustainable Development Goals

Like water, it is easy to demonstrate empirically the importance of human access to food. Regarding the First UN's Sustainable Development Goal of **No Poverty**, we were able to find a significant statistical relationship between adequate nourishment and the percentage of the population above the poverty line. Our statistic is a direct measure of the UN's second goal of **Zero Hunger**. And with regard to the third goal of achieving **Good Health**, we were able to show that adequate nourishment is significantly related to reductions in both infant and maternal mortality rates. Related to the UN's sixth goal of **Clean Water and Sanitation**, we also found a positive and statistically significant relationship between adequate nourishment and access to better sanitation. Finally, we found that access to food is related to the sixteenth UN goal of **Peace, Justice and Strong Institutions** by observing a statistically significant relationship between access to food and lover levels of corruption perception.

(See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)

Source: USAID Photo Gallery

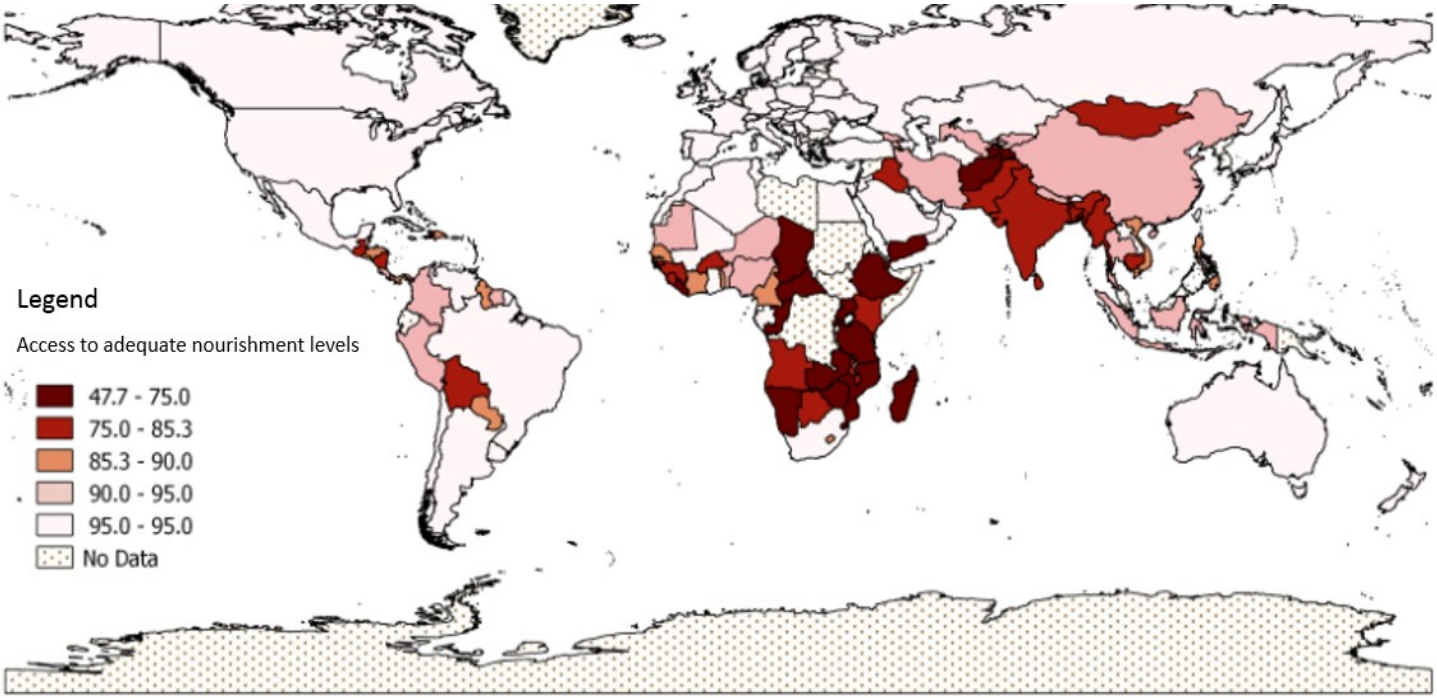
Table 2: Top ten most deprived nations with respect to adequate nourishment

Rank	Country	Food (2014)
1	Haiti	47.7
2	Zambia	51.6
3	Central African	55.5
4	Namibia	57.7
5	Chad	63.9
6	Tajikistan	66.0
7	Zimbabwe	66.0
8	Ethiopia	66.9
9	Madagascar	67.2
10	Rwanda	67.3

HOUSING

Pope Francis includes housing as one of his four primary indicators of material wellbeing. People require adequate physical space in order to create safe, secured and nurturing homes for their families.

Figure 2: Map of the level of access to adequate **nourishment averaged over a three-year period (2013-2015)**



Adequate housing with secure tenure can also provide households with regular access to basic sewage, safe drinking water, garbage collection, and electricity. The lack of proper housing and the proliferation of slums around the world often mark whole groups of people who are experiencing homelessness and exclusion from mainstream society.

In the 2016 Fordham Francis Index publication, the "measure of access to improved sanitation facilities" was used as a proxy for adequate housing. This measure of sanitation was found to be highly correlated at nearly 80% with another material index measure, access to improved drinking water. Since our measure of housing was more or less simply replicating what we would know from our measure of water we decided to consider 3 alternative indicators to represent adequate housing, namely: access to electricity, access to a cooking stove and flooring.

Ultimately, the decision was taken to select *Access to Adequate Flooring* to be the new proxy for adequate housing. The definition of flooring is that if the flooring material used in a house is made up of dirt, dung, or sand, the home is considered not to meet minimum standards. The reasons for selecting this measure are three-fold. First, flooring is much less correlated with other measures of material wellbeing. Second, it is fairly simple to walk into a house and determine whether or not the floor is made of dirt, dung, or sand, making it a reliable measure. Thirdly, the quality of flooring indicates an ability to provide a secure and healthy home environment for its members.

We obtained our data on access to adequate flooring from the Oxford Poverty & Human Development Initiative database which was started in 2010 with data ranging back to 2003. Their most recent data for 2014 covered 109 countries.

International Distribution of Need

Figure 3 maps the percentage of a population with access to adequate flooring. It is easily seen that housing deprivation is highly concentrated in the dark green areas of Sub Sahara Africa. Table 3 is a list of the top ten most deprived nations with respect to access to adequate housing. All ten countries are located in Sub Sahara Africa.

UN Sustainable Development Goals

Similar to water and food, we found that housing is strongly related to achieving several of the UN's Sustainable Development Goals. Regarding the First UN's Sustainable Development Goal of **No Poverty**, we were able to find a significant statistical relationship between access to adequate housing and the percentage of the population above the poverty line. And with regard to the third goal of achieving **Good Health**, we were able to show that access to housing is significantly related to reductions in both infant and maternal mortality rates. Related to the UN's sixth goal of **Clean Water and Sanitation**, we also found a positive and statistically significant relationship between access to housing and access to sanitation.

Figure 3: Map of the percentage of a population with access to adequate flooring (2014)

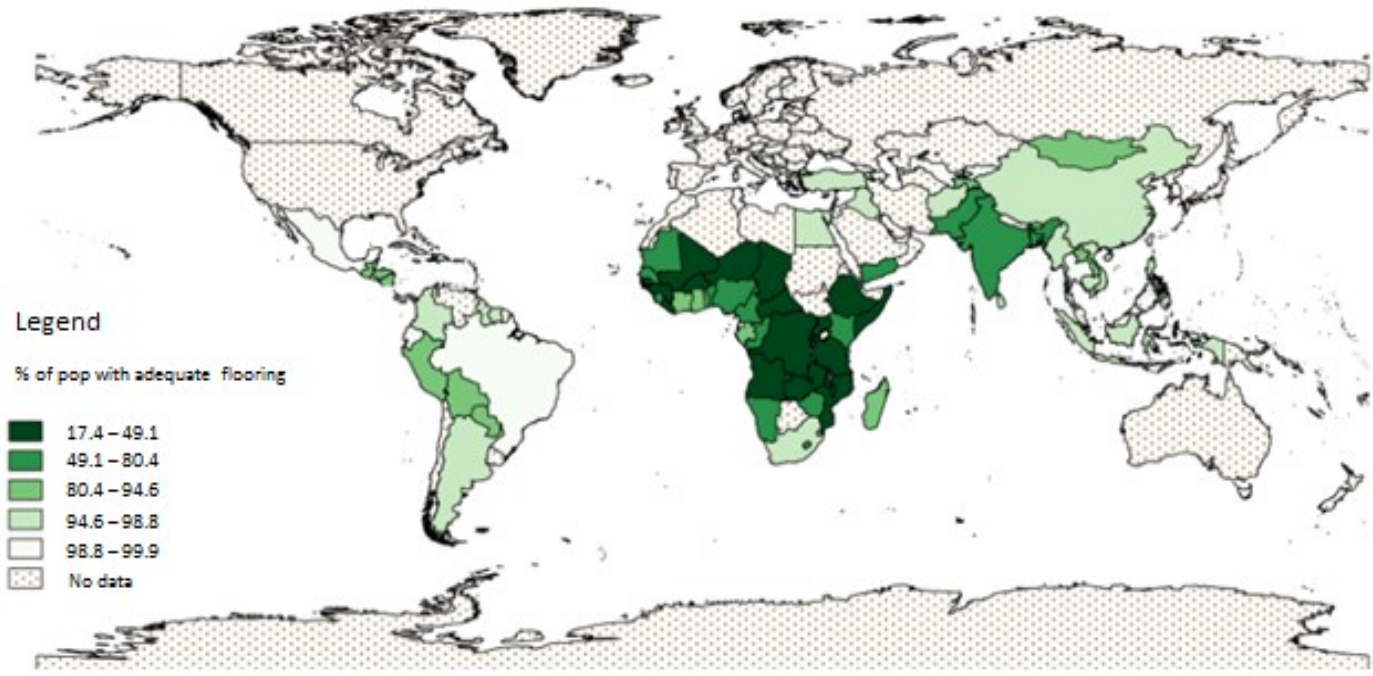


Table 3: Top ten most deprived nations with respect to access to adequate flooring

Rank	Country	Housing (2014)
1	Ethiopia	17.4
2	Niger	20.2
3	Burundi	23.6
4	Mali	28.8
5	Central African Republic	30.5
6	DRC	31.2
7	Rwanda	37.0
8	Guinea Bissau	37.2
9	Mozambique	38.1
10	Angola	38.8

Unlike water and food, however, we did not find a statistically significant relationship between housing and any reduction in the perception of corruption.

(See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)

EMPLOYMENT

The last material indicator selected by Pope Francis was employment. According to Pope Francis, government leaders should ensure that everyone has the minimum spiritual and material means, not only to live in dignity, but to also create and support a family, the primary cell of any society. As such, employment is required to facilitate this development. The selected metric for employment is the *unemployment rate*, which is defined as the percent of the labor force that is not employed but actively seeking employment and willing to work.. For 2014, the World Bank provided us with unemployment rate data covering 173 countries. For the purpose of presenting our data we subtracted the unemployment rate from 100% to calculate the employment rate. In this way we have a positive measure of human well-being, similar to our other indicators.

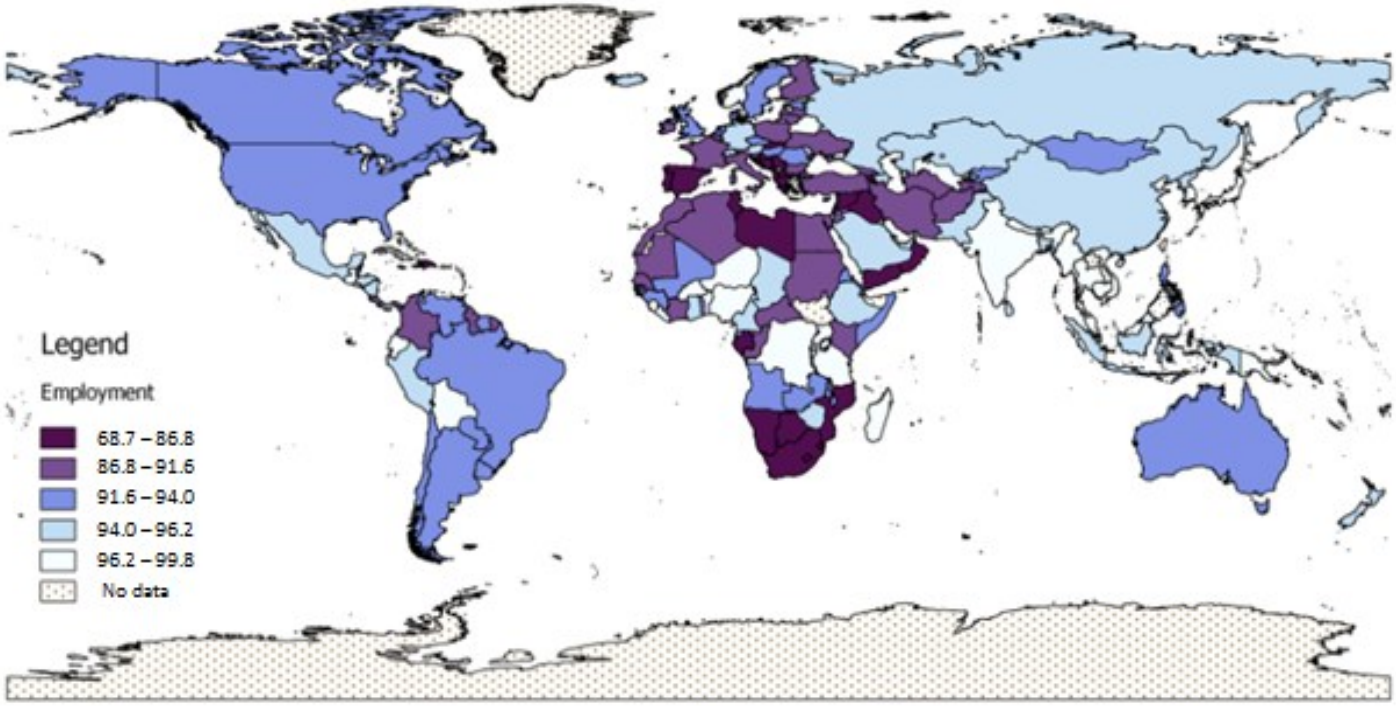
International Distribution of Needs

Using 2014 data from the World Bank, the dark purple areas of the map below in Figure 4 indicates a concentration of low employment levels across Africa, the Middle East, and parts of Europe. Table 4 lists the ten countries in the world with the lowest reported employment rates: two are in Oceania, five are in Africa and three are in Europe.

Table 4: Top ten most deprived nations with respect to employment

Rank	Country	Employment Rate (2014)
1	Solomon Islands	68.7
2	Kiribati	69.4
3	Namibia	70.4
4	Gambia	70.4
5	Macedonia	72.0
6	Bosnia and Herzegovina	72.5
7	Swaziland	73.3
8	Greece	73.5
9	Mozambique	74.7
10	South Africa	75.1

Figure 4: Map of the percentage of the population with employment (2014)



UN Sustainable Development Goals

Perhaps because it effects many of the UN Sustainable Development Goals indirectly through other variables we have not yet been able to establish a statistically significant relationship between employment and some of the UN Goals that are related to water, food, and housing. The employment rate, however, is a direct measure of achieving the eight UN Sustainable Development Goal of **Decent Work and Economic Growth**.

(See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)

Spiritual Wellbeing Indicators

In this section we will review each of Pope Francis' indicators of spiritual wellbeing: religious freedom, education, and other civil rights (gender equity), respectively. We will describe the choice of statistics we used to measure each indicator, identify those areas of the world most lacking these basic spiritual needs, and then relate the successful provision of these basic spiritual needs to the achievement of some of the UN's Sustainable Development Goals

EDUCATION

Education is one of the key primary indicators chosen by Pope Francis to measure spiritual wellbeing. According to Francis, human dignity and development cannot be imposed. Rather, "they must be built up and allowed to unfold for each individual, for every family, in communion with others, and in a right relationship with all those areas in which human social life develops." Education, similar to our other indicators of spiritual wellbeing, is a critical element that enables the poor to be "dignified agents of their own destiny."

We chose the *adult literacy rate* as our statistic to measure a basic minimum level of education that should be available to all. The Adult Literacy Rate is formally defined as the percentage of the population age 15 and above who can read, write, and comprehend a simple statement about their everyday life.

This measure captures how many individuals received a basic education that enables them to participate within the formal economy. This measure is not simply a performance measure like attendance at school or the completion of a set number of grades. Rather it is an impact indicator measuring whether or not individuals have mastered basic reading skills. It measures the actual impact of the education provided.

The UN Educational, Scientific, and Cultural Organization (UNESCO) and the World Bank, collects as well as monitors the reliability and accuracy of the measure. Data used for each country is the most recent available between 2010-2014. A total of 144 countries had data for this time period from UNESCO's database.

Source: USAID Photo Gallery

Table 5: Top ten most deprived nations with respect to education

Rank	Country	Education (2014)
1	Niger	15.5
2	Guinea	25.3
3	Benin	28.7
4	Afghanistan	31.7
5	Mali	33.6
6	Burkina Faso	34.6
7	Central African Republic	36.8
8	Ethiopia	39
9	Chad	39.0
10	Ivory Coast	41.0

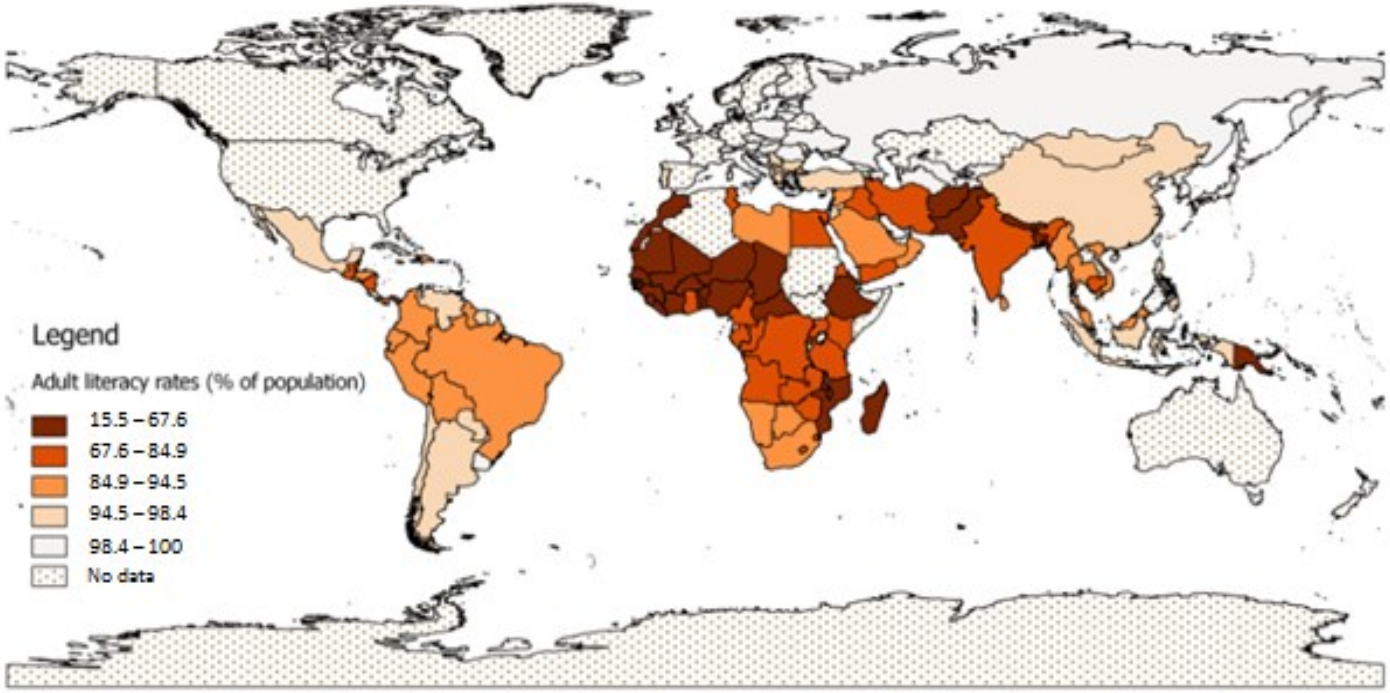
International Distribution of Needs

Figure 5 is a mapping of adult literacy rates around the world in 2014. Counties with the lowest literacy rates are shaded in dark brown and seem to be concentrated in equatorial Africa and sporadically in Asia. Table 5 lists the ten countries with the lowest rates of adult literacy. Nine out of the ten countries with the lowest rates of adult literacy are in Africa and one is in Asia.

UN Sustainable Development Goals

Like water, food, and housing, it is easy to demonstrate empirically the importance of education. Regarding the first UN's Sustainable Development Goal of **No Poverty**, we were able to find a highly

Figure 5: Map of adult literacy rates as a percentage of the population (2014)



significant statistical relationship between adult literacy and the percentage of the population above the poverty line. And with regard to the third UN goal of achieving **Good Health**, we were able to show that adult literacy is highly significantly related to reductions in both infant and maternal mortality rates. Related to the UN's sixth goal of **Clean Water and Sanitation**, we also found a positive relationship between education and access to better sanitation. Finally, we found that adult literacy is related to the sixteenth UN goal of **Peace, Justice and Strong Institutions** by observing a statistically significant relationship between adult literacy and lover levels of corruption perception.

(See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)

GENDER

In promoting rights to life, dignity, and development, Pope Francis emphasized that access to these rights must be inclusive. It is through exclusion and marginalization that many continue to suffer in poverty today. In order to foster integral human development, Pope Francis stressed gender equity, specifically in education. Furthermore, if a country is preventing one gender from accessing education that may also indicate exclusion from other sectors of society as well as discrimination against other social groupings.

Previous work done by Fordham researchers used the Youth Gender Parity Index as the gender measure for the FFI. This indicator is the ratio of female youth literacy rates to male youth literacy rates between the ages of 15 and 24. Unfortunately this measure of female inclusion in education was closely correlated with our measure of education, adult literacy. In fact we found that our gender indicator was nearly 90% correlated with our education indicator, meaning that they simply duplicated one another for the most part. We therefore attempted this year to try another measure of female inclusion in some other significant aspect of society besides education.

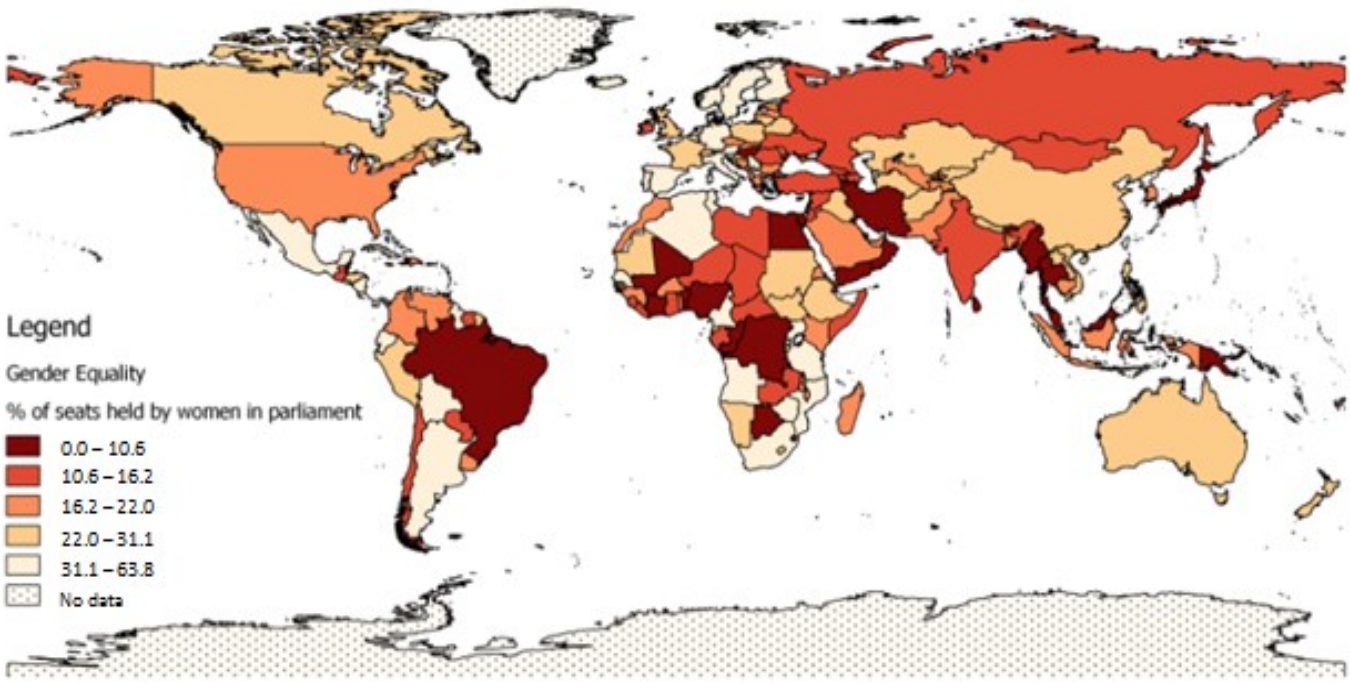
For this year's report we chose to use the *proportion of seats held by women in national parliaments*. Women's access to the political process and policy-making may be key for the representation and empowerment of women. Many feel that women's empowerment is conducive for development and growth. The political inclusion of women fits in very well with Pope Francis' vision of creating a world where no one is marginalized and all have the ability to become "dignified agents of their own destiny."

The Inter-Parliamentary Union maintains a database

Table 6: Top ten most deprived nations with respect to representation of women in parliament

Rank	Country	Gender (2014)
1	Tonga	0
2	Palau	0
3	Qatar	0
4	Vanuatu	0
5	Yemen	0.3
6	Oman	1.2
7	Kuwait	1.5
8	Egypt	2
9	Solomon Islands	2
10	Papua New Guinea	2.7

Figure 6: Map of the women's representation in national parliaments (2014)



and provided us with the proportion of seats held by women in national parliaments for 2014 which covered 183 countries.

International Distribution of Needs

Figure 6 is an international mapping of women's representation in national parliaments in 2014. The map shows that that low levels of women's representation is more widespread around the world with no special region having an overwhelming concentration.

Table 6 highlights the top ten nations with the lowest levels of women representation in parliament. Of these ten countries 5 are in Oceania and 5 are in the Middle East.

UN Sustainable Development Goals

Besides being a direct measure of the fifth UN Sustainable Development Goal of **Gender Equality**, we have not yet been able to establish any statistically significant relationships with other UN development goals.

(See appendix B for more details regarding the statistical analyses between the Fordham Francis Index indicators and the UN Sustainable Development Goals.)

RELIGIOUS FREEDOM

Pope Francis specifies that religious freedom is also among the absolute minimum requirements needed to live in dignity. Governments must protect the religious freedom of their citizens. Creating an environment suitable for religious freedom means ensuring each person, consistent with the common good, has the opportunity to act in accordance with his or her conscience. Religious freedom, similar to education and other civil rights such as gender equity, may be an important component in empowering the marginalized "to be dignified agents of their own destiny."

We used the *Government Restrictions Index (GRI)* from the Pew Research Center as our metric to measure religious freedom. We found this measure to be most suitable because it also accounts for the role of government institutions in promoting or deterring religious freedom.

Photo Credit: Armand Aquino

Table 7: Top ten most deprived nations with respect to religious freedom

Rank	Country	Religious Freedom (2014)
1	China	1.4
2	Egypt	1.7
3	Uzbekistan	1.8
4	Turkey	1.9
5	Indonesia	2.1
6	Iran	2.3
7	Saudi Arabia	2.4
8	Syria	2.4
9	Azerbaijan	2.5
10	Kazakhstan	2.5

The Pew Research Center compiles 20 measures of restrictions, including efforts by government to ban particular faiths, prohibit conversion, limit preaching or give preferential treatment to one or more religious groups. The Pew Research Center employs extensive data verification checks and obtains its data from various government and independent sources giving us confidence that the Government Restrictions Index (GRI) is reliable, consistent, and comprehensive.

For the year 2014 the Pew Research Center provided data covering 196 countries.

International Distribution of Needs

Figure 7 is an international mapping of religious freedom for 2014. The lack of religious freedom, shown in the dark areas on the map, are concentrated in the Middle East and in large parts of Asia..

Figure 7: Map of Religious Freedom (2014)

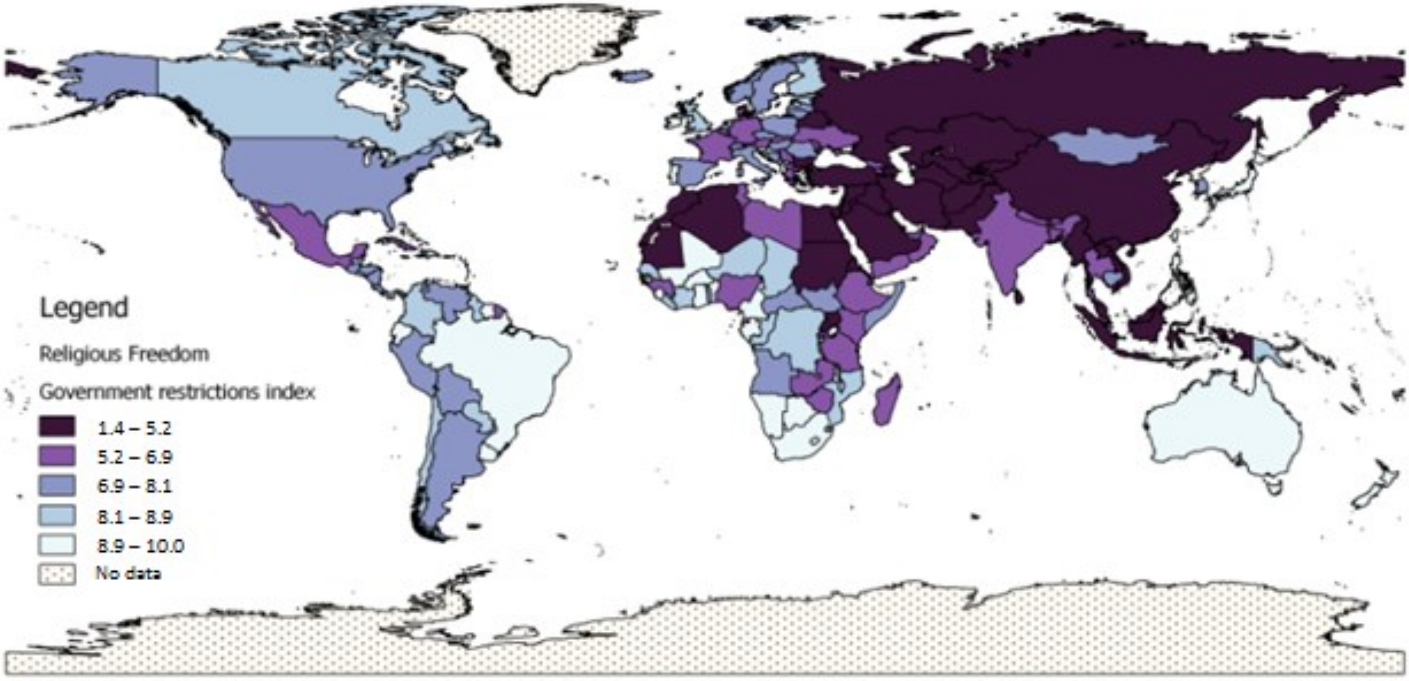


Table 7 highlights the top ten nations with the lowest levels of religious freedom. Of these ten countries 5 are in North Africa and the Middle East, 3 are in Central Asia, and two are in East Asia.

UN Sustainable Development Goals

Religious Freedom is correlated with a number of UN Sustainable Development Goals, (SDG's) both positively and negatively. In all cases, however, our religious freedom metric is only able to account for a small amount of the variation in each SDG target. We therefore see these results as tentative requiring additional analysis. Our initial tentative results, however, are interesting. Regarding the third goal of **Good Health**, religious freedom is correlated with increases in maternal mortality, but not statistically related to infant mortality. It is also correlated with reduced access to sanitation. On the other hand with respect to the tenth goal of **Reduced Inequalities**, religious freedom is positively correlated with lower income inequality. And finally, regarding the sixteenth UN goal of **Peace, Justice and Strong Institutions**, religious freedom is associated with reduced corruption. While these results are interesting, we must reserve final judgement. They could change significantly when additional explanatory variables are included in the analysis.

Correlation Matrix

While the seven primary indicators should be highly correlated with all important measures of development, ideally these seven indicators should also be independent from each other. As a rule of thumb, a correlation coefficient with an absolute value of more than 0.60 is deemed high, meaning that the two indicators are too strongly correlated, either positive or negative. We calculated the correlation coefficients for each pair of primary indicators. The results are presented below in a correlation matrix (Table 8). Boxes highlighted in yellow contain correlation coefficients that exceed the absolute value of .60 or 60%. Last year's correlation matrix showed very high levels of correlation between gender and housing with other indicators. This prompted our selection of different measures for the aforementioned indicators in this year's report. These changes have enabled us to remove all indicators that were very highly correlated at 80 or 90%. Their removal subsequently improved the robustness of this year's Fordham Francis Index.

An analysis of the correlation matrix shows that the water measure is still strongly correlated with both our food and housing measures respectively. This suggests the primal importance of water in a person's wellbeing. Additionally, housing and education are highly correlated, suggesting an important relationship between housing and education. Finally,

Table 8: Correlation Matrix – Correlation Coefficients of the Seven Primary Indicators in the FFI (2014)

	Water	Food	Housing	Employment	Education	Gender	Religious Freedom
Water	1						
Food	0.61	1					
Housing	0.65	0.52	1				
Employment	-0.10	0.00	-0.15	1			
Education	0.59	0.33	0.74	-0.12	1		
Gender	-0.06	-0.05	-0.13	-0.04	0.09	1	
Religious Freedom	-0.07	-0.05	-0.24	-0.22	-0.22	0.04	1

as was the case in the 2016 FFI report, it is worth noting that civil rights, such as religious freedom and gender equity, have very low levels of correlation with any of the other primary indicators. This result is important because one of the characteristics that makes the FFI unique is its inclusion and emphasis on civil rights as a means of measuring development. Other development indexes, such as economic income or the UN Human Development Index (HDI), exclude religious freedom and other political dimensions that are included in the FFI. By including religious freedom and other civil rights as important indicators of development, the Pope is enabling us to study an under-explored area of analysis into the drivers of poverty and development. The focus on civil rights may align very well with Francis' insistence that the poor be "dignified agents of their own destiny."

Our approach to computing the Fordham Francis Index is identical to the methodology employed by the United Nations Development Program in their calculation of the Human Development Index (HDI). Using the same approach assures that different implications between the indices are due to substantial differences in their components, such as our focus on basic needs both material and spiritual, and not simply due to technical differences in how we aggregated the various components.

Initially, we inverted our measures of food (undernourishment), employment (unemployment), and religious freedom (government restrictions index) so that for all seven of our measures a higher number would represent a better outcome and hence a higher standardized score.

Thereafter, we standardized our seven primary indicators of water, food, housing, employment, education, gender and religious freedom so that they each yielded indices with values between 0 and 1 according to the following formula:

$$Primary\ Indicator\ Score = \frac{X - Min\ Theoretical\ Value\ of\ Statistic}{Max\ Value\ of\ Statistic - Min\ Theoretical\ Value\ of\ Statistic}$$

In line with best practice, the maximum values were set to the historical maximum observed within each dataset of the respective indicator. Meanwhile, the minimum values were set to the lowest observed value for each indicator within the existing dataset up until 1990 (see appendix E for countries and year).

Table 9: Measurement parameters for each indicator

	Minimum	Maximum
Housing	17.4	100.0
Gender	0.0	63.8
Religious Freedom	0.9	10.0
Employment	68.7	99.8
Water	13.2	100.0
Education	15.5	100.0
Food	47.7	95.0

Next, we created a Material Wellbeing Index (MWI) by computing the geometric mean of the four normalized indices of water, food, housing, and employment according to the following formula:

$$Material\ Wellbeing\ Index = Water^{\frac{1}{4}} + Food^{\frac{1}{4}} + Housing^{\frac{1}{4}} + Employment^{\frac{1}{4}}$$

It is important to note that equal weight was given to all four components when computing the Material Wellbeing Index (MWI).

Similarly, we created a Spiritual Wellbeing Index (SWI) by computing the geometric mean of the three

normalized indices of education, gender equity, and religious freedom according to the following formula:

$$\textbf{Spiritual Wellbeing Index} = \textit{Education}^{\frac{1}{3}} + \textit{Gender}^{\frac{1}{3}} + \textit{Religious Freedom}^{\frac{1}{3}}$$

As was the case with the Material Wellbeing Index, we gave equal weight to all three components when computing the Spiritual Wellbeing Index.

Finally, we computed Fordham's Pope Francis Global Poverty Index by calculating the geometric mean of the Material Wellbeing Index and the Spiritual Wellbeing Index according to the following formula:

$$\textbf{Fordham Francis Index} = \textit{Material Wellbeing Index}^{\frac{1}{2}} + \textit{Spiritual Wellbeing Index}^{\frac{1}{2}}$$

Again, we gave equal weight to both the Material Wellbeing Index and the Spiritual Wellbeing Index.

Data collected for each indicator were from 2014, except in the instance of food. The food measure is reported as a three-year average from 2013-2015. The year 2014 was selected as it was the most recent year that had a large number of available observations for all variables. That said, the housing variable was the most limiting variable with only 109 observations which subsequently limits the dataset for our Material Wellbeing Index and the Fordham Francis Index, respectively.

Material Wellbeing Index

In order to provide a comparison between the Material Wellbeing Index (MWI) and the more conventional measures of poverty and deprivation, the Material Wellbeing Index (MWI) was regressed separately on *economic wellbeing*, measured as the *logarithm of Per Capita GDP*, and on the Human Development Index (HDI). The Human Development Index (HDI) expands our economic wellbeing measurement of human welfare by including an indicator of health measured by life expectancy and an indicator of knowledge measured by the mean of actual and expected years of schooling) in addition to a more traditional indicator of economic wellbeing measured by per capita gross national income. Our results indicate a strong statistical relationship of our Material Wellbeing Index (MWI) with both economic wellbeing and the Human Development Index (HDI) (Table 10). Additionally, R^2 values imply that only 36% and 50% of the variation in values of the Material Wellbeing Index (MWI) are explained by economic wellbeing or the Human Development Index (HDI), respectively.

Table 10: Ordinary least squares regression results of the MWI and two commonly used poverty measures

Variables	Material Wellbeing		Economic Interpretation
	Regression Coefficient (t-stat)	R^2	
Economic Wellbeing (GDP per Capita in log	3.19 (6.84)	0.36	A 1% increase in per capita income is associated with a 3.19% increase in the MWI
Human Development Index	0.46 (9.02)	0.50	A 1% increase in the HDI is correlated with a 0.46 percentage point increase in the MWI

The unexplained variation in Material Wellbeing Index (MWI) can be attributed to the additional indicators not considered by the former two indices. The graph in Figure 8 illustrates a positive relationship between the log of Gross Domestic Product (GDP) per capita and the MWI score. Transforming the data on the Gross Domestic Product (GDP) per capita into a logarithmic scale allows us to run a linear regression analysis. Countries are essentially ranked from low to high income.

An interpretation of the R^2 shows that GDP per capita explains only 36% of changes in Material Wellbeing Index as measured by Pope Francis' primary indicators. Therefore, other factors such as government policy, can explain the remaining 64%. For instance, Angola and Thailand have similar levels of income, yet there is a large difference in their Material Wellbeing Index (MWI) scores (0.51 and 0.97, respectively). Thailand has significantly higher scores in providing clean water and basic housing compared to Angola, even though both have similar levels of income. The Fordham Francis Index ranks countries who use their economic resources to meet basic material needs higher than countries who may have the same level of resources but decide not to focus on the basic human needs of water, food, housing, and employment.

Similar to economic wellbeing, there is also a strong positive relationship between our Material Wellbeing Index (MWI) and the UN Human Development

Figure 8: Regression results of the Material Wellbeing Index (MWI) and the log of GDP per capita

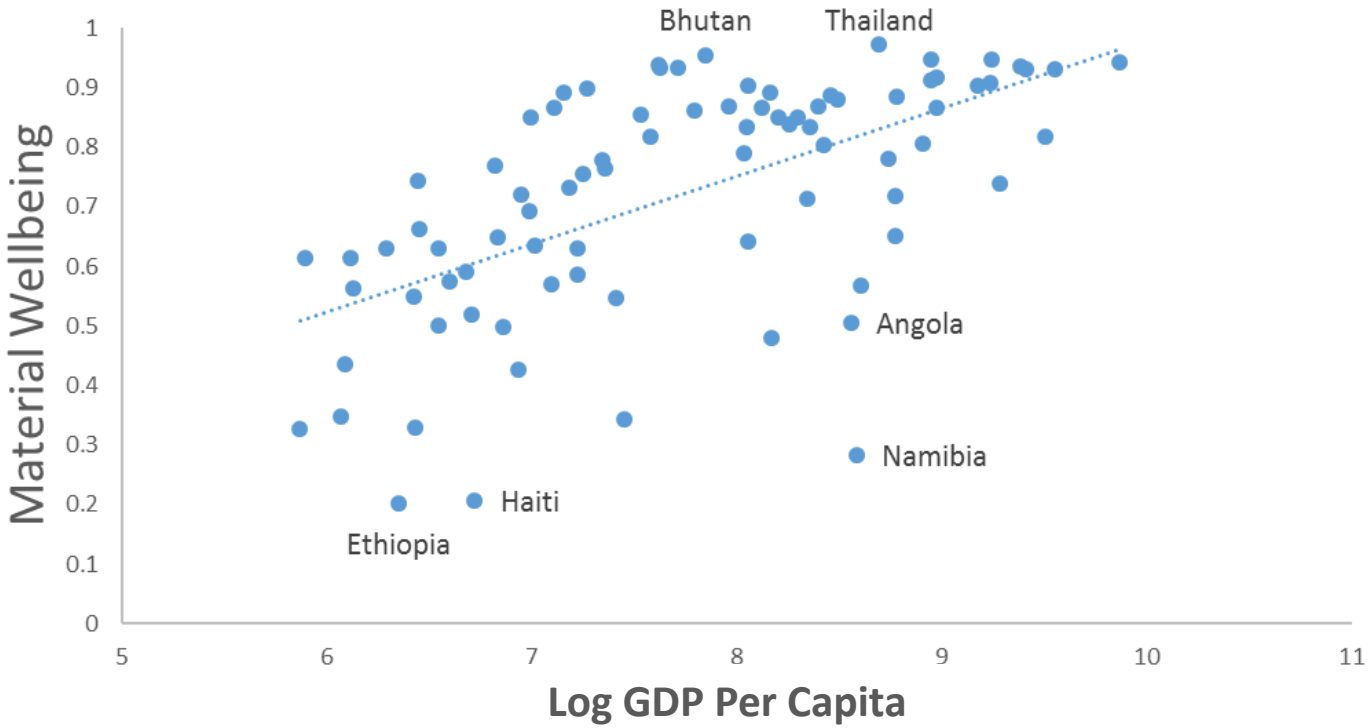
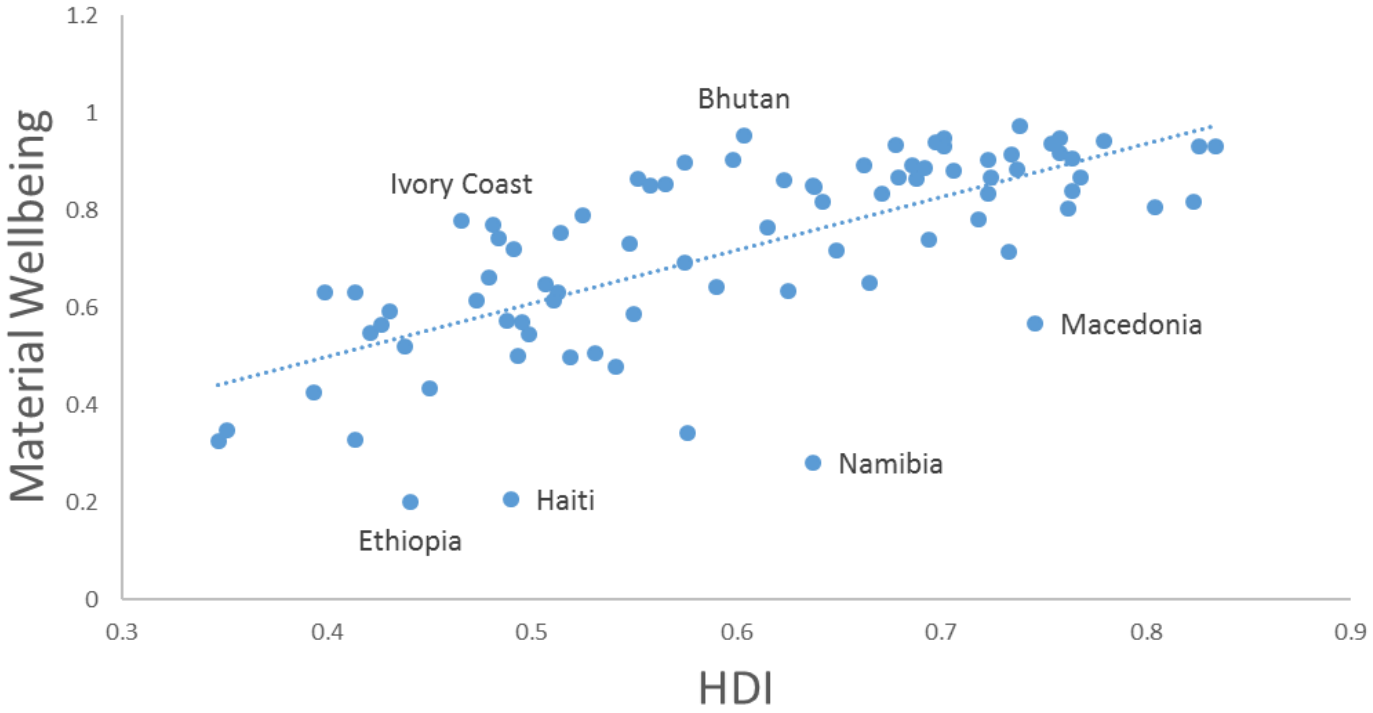


Figure 9: Regression results of the Material Wellbeing Index (MWI) and the Human Development Index (HDI)



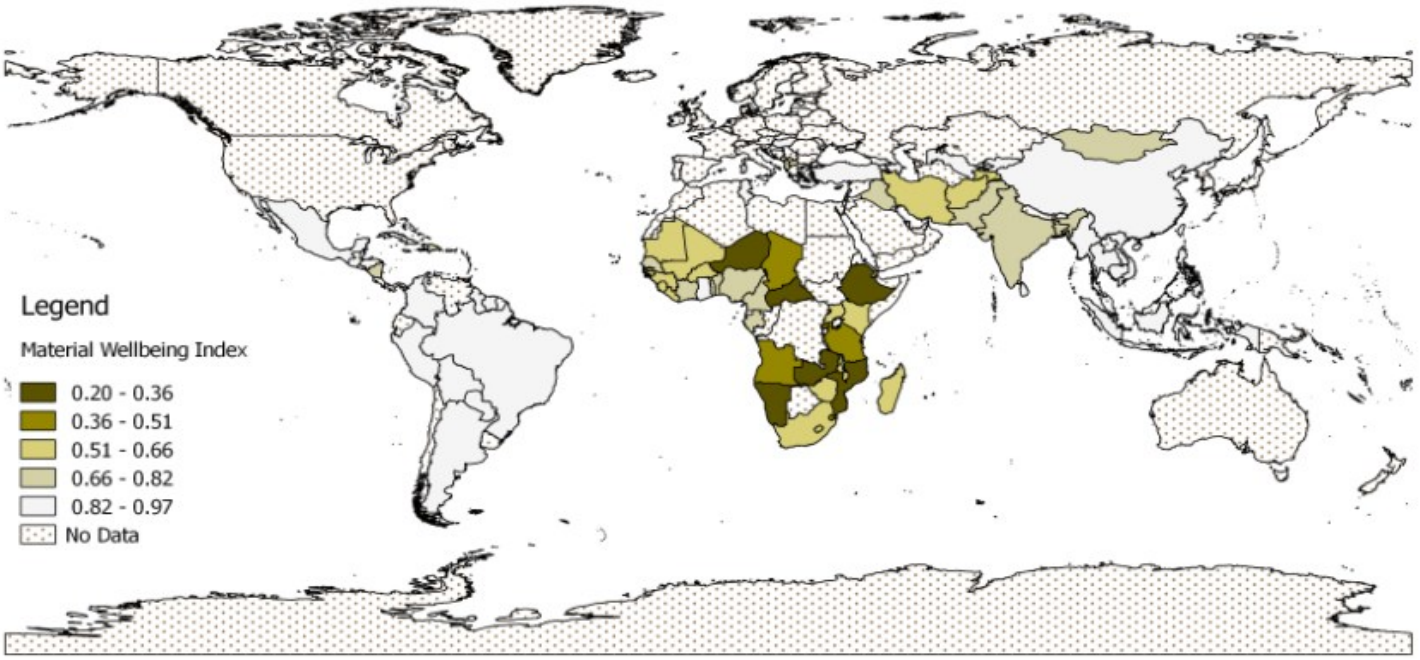
Index (HDI). The Material Wellbeing Index (MWI) scores are dispersed in countries with low to medium Human Development Index (HDI) scores but converge at the upper end of the UN Human Development Index (HDI) range (Figure 9). Interestingly, there are countries which are categorized in the Human Development Index (HDI) as low but may have high Material Wellbeing Index scores because of the priority they place on providing clean water, adequate food, basic housing, and employment. Take for example the Ivory Coast which has a low Human Development Index (HDI) score of 0.46 but a material wellbeing index of 0.78. Alternatively, Macedonia's Material Wellbeing Index (MWI) score is 0.57 while its HDI is 0.75. The former's high Material Wellbeing Index (MWI) score is primarily due to its relatively high levels of education, food and water.

The map in Figure 10 highlights the geographical distribution of Material Wellbeing Index scores across the sample. The lowest scores are largely distributed across Sub-Saharan Africa. That said, South American countries have a relatively high material wellbeing index.

Spiritual Wellbeing Index

In order to provide a comparison between the Spiritual Wellbeing Index (SWI) and alternative measures of development, the Spiritual Wellbeing Index (SWI) was also regressed with *economic wellbeing*, measured as the *logarithm of GDP per capita*, and the Human Development Index (HDI). The results

Figure 10: Map of the Material Wellbeing Index (2014)



indicate a significant positive statistical relationship between our Spiritual Wellbeing Index (SWI) and both economic wellbeing and the Human Development Index (HDI) (Table 11). The respective R^2 values of the regressions, however, imply that only 10% of the variation in the Spiritual Wellbeing Index is explained by either changes in economic wellbeing or changes in the Human Development Index. The large unexplained variations in our Spiritual Wellbeing Index (SWI) can be attributed to the additional dimensions of gender and religious freedom not considered by the other two poverty measures.

The low R^2 of 10% indicates that Spiritual Wellbeing has a weak link to Economic Wellbeing. For example, Egypt and Bolivia have similar levels of per capita GDP, but have very different scores on our Spiritual Wellbeing Index (SWI). Bolivia is an example of a country that does much better than countries with the same level of income, while Egypt's overall score is pulled down primarily by its low score on the religious freedom index. The results imply that high income does not necessarily translate into high spiritual wellbeing. The Spiritual Wellbeing Index (SWI) and the Human Development Index (HDI) also demonstrate a significant positive relationship, but again with HDI only explaining 10% of the SWI. (Figure 12). There are many countries that are ranked low by the Human Development Index (HDI) that exhibit a high measure of spiritual wellbeing, while many countries ranked high or very high by the HDI exhibit a low measure of spiritual wellbeing. Rwanda for instance, has a low HDI score (mainly because of its low per capita income) but has a high Spiritual Wellbeing Index (SWI) score. Conversely, China has a high HDI score, but is doing poorly in terms of its Spiritual Wellbeing Index (SWI) score. While China is

Table 11: Ordinary least squares regression results of the SWI and three commonly used poverty measures

Variables	Spiritual Wellbeing		Economic Interpretation
	Coefficient (t-stat)	R^2	
GDP per Capita Log form	1.8 (2.71)	0.1	A 1% increase in Per Capita GDP is associated with a 1.8% increase in the SWI
HDI	0.24 (2.99)	0.1	A 1% increase in HDI is correlated with a 0.24% increase in SWI

performing well in terms of per capita income and literacy, they are among those countries with limited religious freedom. The map in Figure 13 highlights the geographical distribution of Spiritual Wellbeing Index scores across our sample of 135 territories. Our mapping shows that low SWI scores are largely concentrated around Asia and Northern Africa and the Middle East.

Figure 11: Regression results of Spiritual Wellbeing Index (SWI) and the log of GDP per capita

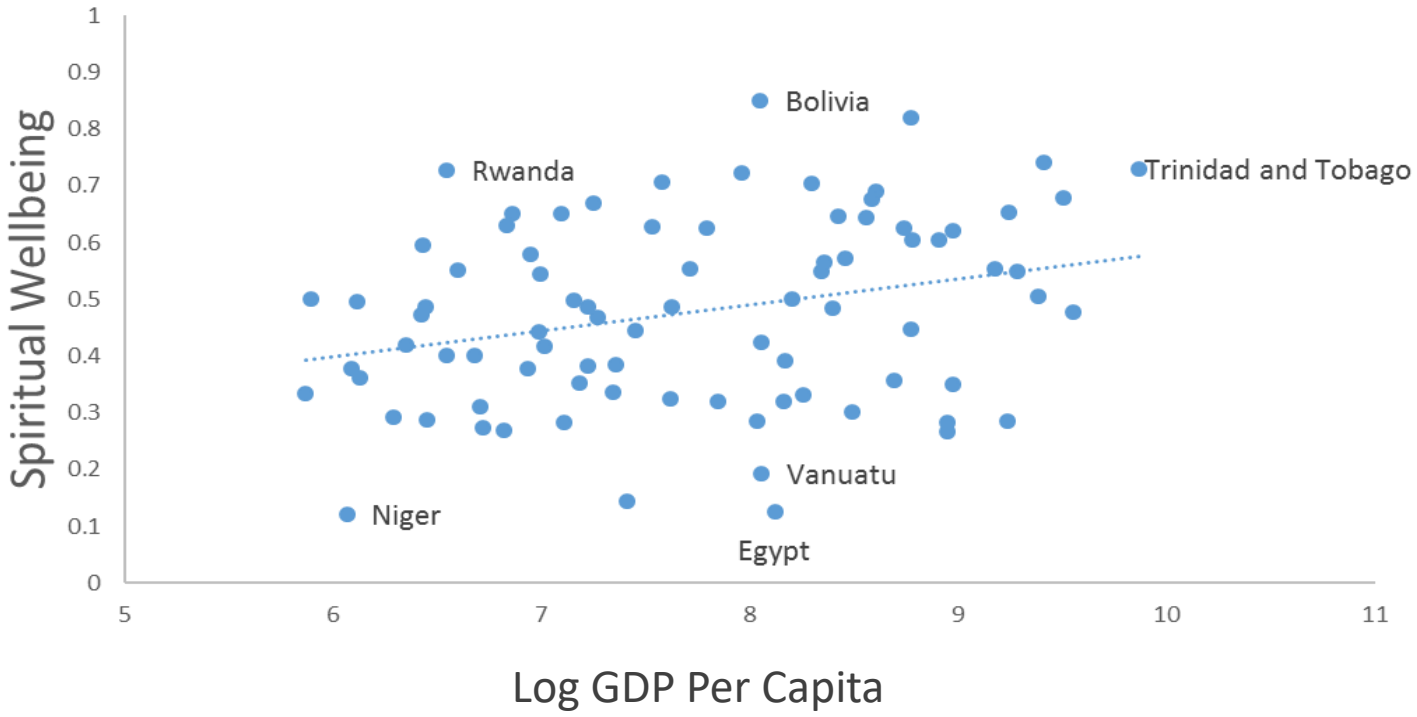


Figure 12: Regression results of Spiritual Wellbeing Index and the Human Development Index

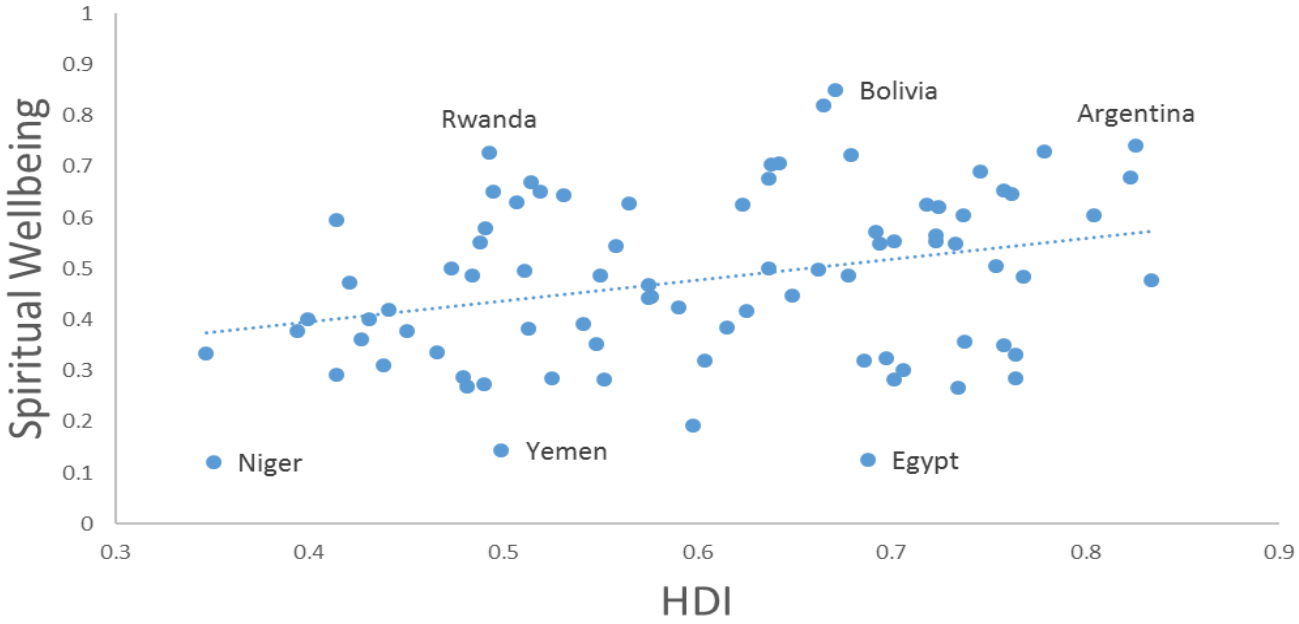
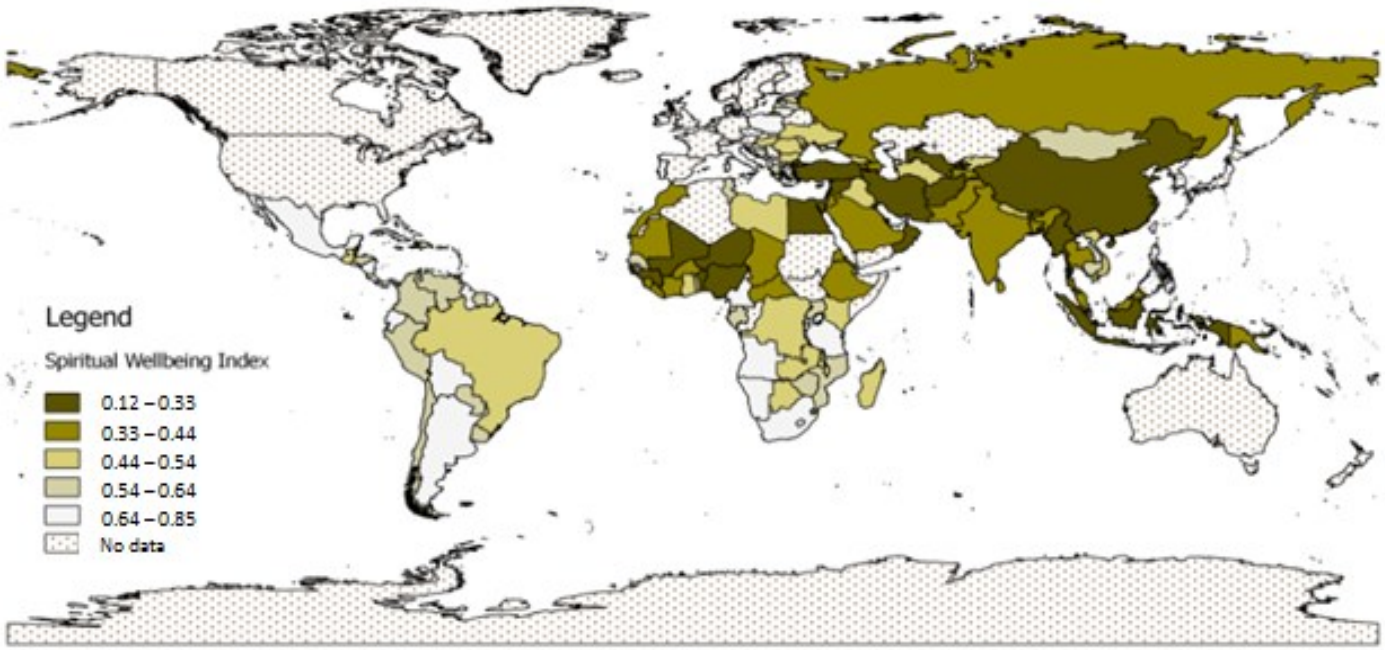


Figure 13: Map of Spiritual Wellbeing Index (2014)



Fordham's Pope Francis Global Poverty Index

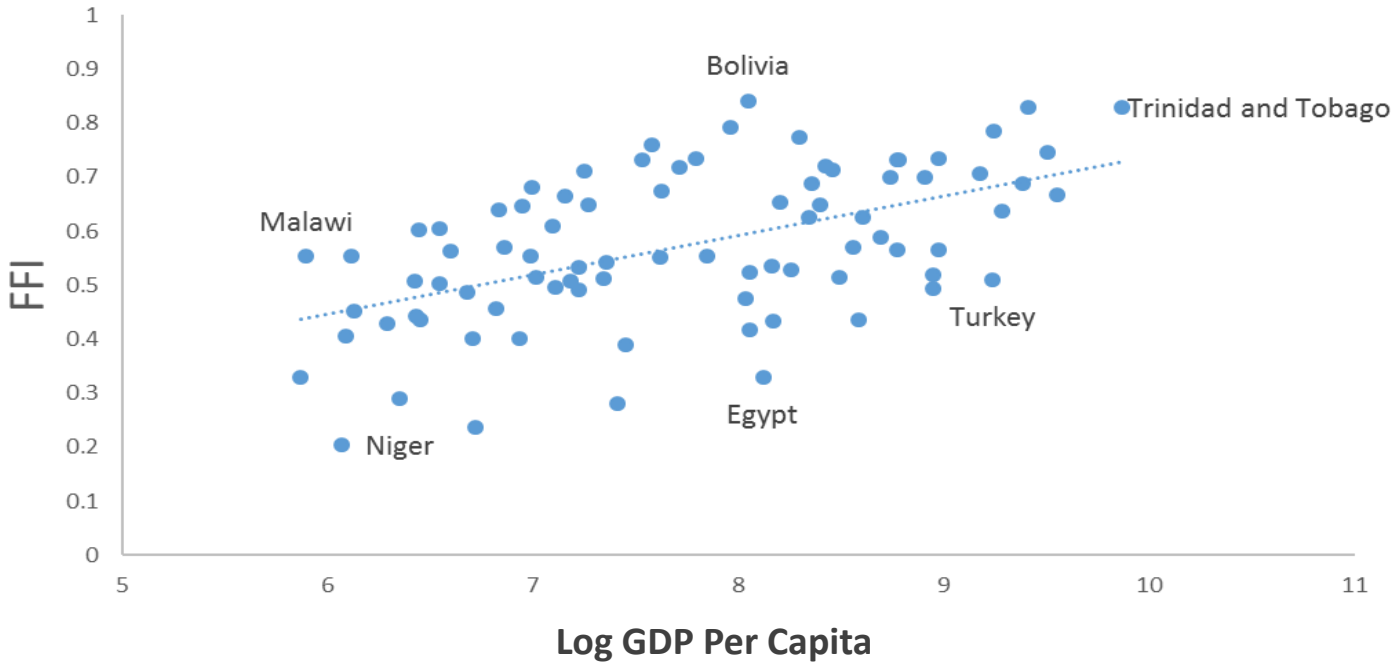
The Fordham Francis Index (FFI) represents an equally weighted aggregation of the Material Wellbeing Index (MWI) and the Spiritual Wellbeing Index (SWI) by taking their geometric mean.

In order to provide a comparison between the Fordham Francis Index (FFI) and standard measures of poverty, the Fordham Francis Index (FFI) was regressed on economic wellbeing, measured as the *logarithm of GDP per capita*, and on the Human Development Index (HDI). The results indicate a strong statistical relationship of the Fordham Francis Index (FFI) with both economic wellbeing and the Human Development Index (HDI) (Table 13). Additionally, the R^2 values of the regressions imply

Table 12: Regression results of the FFI and two commonly used poverty measures

Variables	Fordham Francis Index Coefficient (t-stat)	R^2	Economic Interpretation
Economic Wellbeing	3.94 (5.77)	0.28	A 1% increase in the log GDP per capita is associated with a 3.94 percent increase in Fordham Francis Index
HDI	0.56 (7.22)	0.39	A 1% increase in HDI is correlated with a 0.56 percent increase in Fordham Francis Index

Figure 14: Regression results of the Fordham Francis Index and the log of real GDP per capita



that only 28% and 39% of the variation in values of the Fordham Francis Index (FFI) are explained by economic wellbeing and the Human Development Index (HDI), respectively. This result is due to the additional dimensions captured in the Fordham Francis Index (FFI). These additional dimensions represent its value added and are what make this new index innovative, namely its focus on basic human needs as well as its inclusion of basic spiritual needs in addition to basic material needs.

The graph in Figure 14 represents the positive relationship between economic wellbeing and the Fordham Francis Index (FFI). It indicates where countries stand in levels of deprivation pertaining to Pope Francis' seven primary indicators relative solely to their per capita GDP. One can notice countries with almost equal levels of economic wellbeing, that, nonetheless, have very different scores on the Fordham Francis Index (FFI). Looking closely at some of these pairs, one can see that the variation between scores measured by the Fordham Francis Index (FFI) primarily stem from the divergence in the spiritual primary indicators, most notably religious freedom. Additionally, for countries at lower levels of economic wellbeing, there is also a divergence caused by differences in the material primary indicators of water and housing. Some countries with the same level of economic resources focus more of their limited resources on providing basic needs such as clean water and adequate housing to the poorer groups in their society and therefore score significantly higher on the Fordham Francis Index (FFI).

The graph in Figure 15 represents the relationship between the Fordham Francis Index (FFI) and the Human Development Index (HDI). It reveals

Figure 15: Regression results of the Fordham Francis Index and Human Development Index

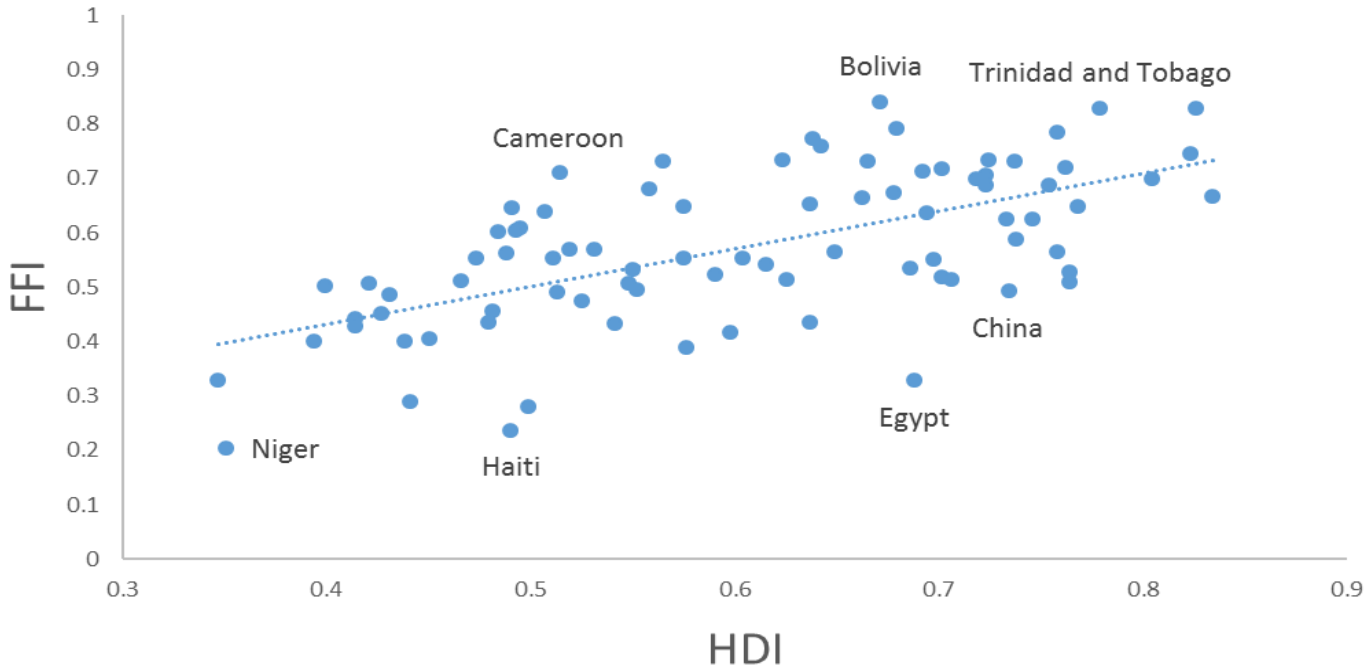
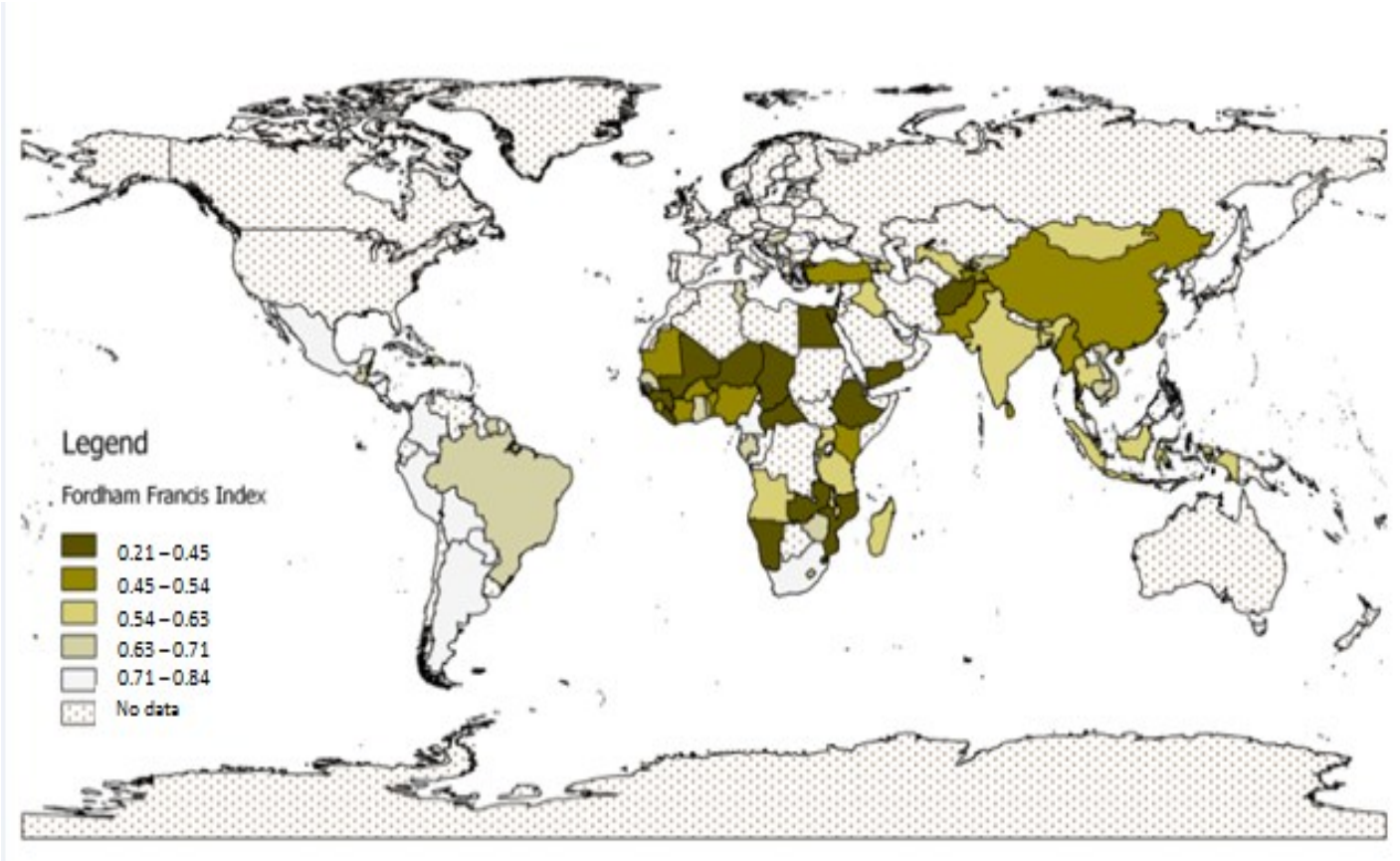


Figure 16: Map of the Fordham Francis Index (2014)



disparities between the two poverty measurements. There are countries, with almost equal scores on the Human Development Index (HDI) that have significantly different scores on the Fordham Francis Index (FFI). Looking closely at some of these interesting pairs, one can see that the variation in Fordham Francis Index (FFI) scores between countries stems from the divergence in spiritual wellbeing and most notably differences in religious freedom. But there are some countries at the lower levels of economic wellbeing where the variation in FFI scores is driven not by differences in religious freedom but by differences in the provision of basic goods needed by the poor such as clean water, adequate nourishment and housing.

To summarize, unlike previous measures of human wellbeing, such as per capita GDP or the Human Development Index (HDI), the Fordham Francis Index (FFI) places a much larger emphasis on satisfying the basic needs of the poor as well as a stronger value on political freedoms and in particular religious freedom and gender equity.

The map in Figure 16 highlights the analysis done for 84 countries and shows that low Fordham Francis Index scores are largely concentrated in both Africa and Asia.

Conclusion

The Fordham Francis Index (FFI) is a multi-dimensional measure of international poverty inspired by Pope Francis' address to the United Nations General Assembly in 2015. In his address Pope Francis identified four basic human needs as essential for a minimal level of material wellbeing. They were water, food, housing, and employment. Francis also identified religious freedom, education, and other civil rights, such as gender equity, as the basic human needs essential for a minimal level of spiritual wellbeing.

The Fordham Francis Index (FFI) is a simple tool. It relies on only seven indicators. It identifies appropriate measures for each of Pope Francis' seven basic human needs and then aggregates them into a material wellbeing index, a spiritual wellbeing index, and an overall Fordham Francis Index. Data for all these measures are easily available for most countries in the world.

Secondly, the Fordham Francis Index (FFI) is also a broad measure of global poverty. Its indicators are related to many of the UN's Sustainable Development Goals (SDG). To date we have documented a strong relationship between the FFI indicators and reduced poverty, better nutrition, and improved health and sanitation.

Do our actions favor the basic needs of the poor?

Thirdly, the Fordham Francis Index (FFI) is innovative in two ways. First, when compared to other measures of poverty such as per capita income and the Human Development Index, it has a stronger emphasis on basic human needs and favors outcomes that benefit the poor. Second, besides including indicators of material wellbeing, it also includes indicators of spiritual wellbeing. These spiritual indicators, such as education and the civil rights of religious freedom and gender equity, may play an important role in empowering the marginal to be champions of their own destinies.

Do our actions enable the poor to become "dignified agents of their own destinies?"

The development of a simple technical instrument of verification like the Fordham Francis Index (FFI) can also empow-

er civil society to carry out their own oversight responsibilities. They can use the FFI to evaluate the efforts of national and international governmental agencies as well as other national and international actors to promote integral human development through the proper attainment of the UN's Sustainable Development Goals (SDG). The FFI is designed to help answer two questions. Do our actions favor the basic needs of the poor? Do our actions enable the poor to become "dignified agents of their own destinies"?

Moving forward, future iterations of the FFI will continue to improve our statistical measures, expand the number of countries that are covered by the index, and analyze additional links between the FFI indicators and the various targets of the UN's Sustainable Development Goals (SDG).

Source: USAID Photo Gallery

APPENDICES

APPENDIX A: VARIABLE DEFINITIONS

Variable	Definition
Maternal Mortality	Maternal mortality ratio is the number of women who die from pregnancy-related causes while pregnant or within 42 days of birth - Worldbank
Infant Mortality	Infant mortality rate is the number of infants dying before reaching one year of age, per 1,000 live births in a given year. - Worldbank
Sanitation	Percentage of population who use an adequate/improved sanitation facility. A sanitation facility is considered adequate/improved if it hygienically separates human excreta from human contact. The types of technology that are likely to meet this criterion are: flush to piped sewer system ; flush to septic tank; flush/pour flush to pit; composting toilet; VIP latrine; pit latrine with a slab - WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
Equality in Income	Measured as the inverse of inequality in income (%): Inequality in income is a distribution based on data from household surveys estimated using the Atkinson inequality index. Note that the numbers given are 100-x, to show the % of equality in income, since higher numbers are better in our index -UNDP Human Development Index
Level of Poverty	Poverty headcount ratio at $1.90 a day (2011 PPP) (% of population): Poverty headcount ratio at $1.90 a day is the percentage of the population living on less than $1.90 a day at 2011 international prices. As a result of revisions in PPP exchange rates, poverty rates for individual countries cannot be compared with poverty rates reported in earlier editions. Note that the numbers given are 100-x, to show the % not living on $1.90 a day, since higher numbers are better in our index - Worldbank
Corruption Index	Measured by Transparency International to ranks countries by their perceived levels of corruption, as determined by expert assessments and opinion surveys. - Transparency International

Water Indicator: **Percentage of population who drink improved drinking water.**	Improved drinking water source include piped water on private premises (piped household water connection located inside the user's dwelling, plot or yard), and other public improved drinking water sources (public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collections) that are nearby. - WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
Food Indicator: **Prevalence of Undernourishment**	The percentage of the population that is continuously unable to consume enough food to meet dietary energy requirements - Food and Agriculture Organization (FAO)
Housing Indicator: **Flooring**	When using flooring as the indicator, the quality of housing is determined based on the make-up of the floor. If the flooring is made up of dirt, dung, or sand, the household is considered to be deprived by this measure. - Oxford Poverty & Human Development Initiative
Employment Indicator: **Unemployment**	Unemployment refers to the share of labor force that is without work but available for and seeking employment. - World Bank
Education Indicator: **Adult Literacy Rate**	The proportion of the adult population aged 15 years and over that is literate. This unit of measurement is expressed as a rate (%). This indicator provides a measure of the stock of literate persons within the adult population who are capable of using written words in daily life and to continue to learn. It reflects the accumulated accomplishment of education in spreading literacy. Any shortfall in literacy would provide indications of efforts required in the future to extend literacy to the remaining adult illiterate population.
Gender Indicator: **Women in Parliaments**	Proportion of parliamentary seats held by women in a single or double chamber (%) - Inter-Parliamentary Union (IPU)
Religious Freedom Indicator: **Government Restrictions Index**	The Government Restrictions Index (GRI) measures on a 10-point scale government laws, policies and actions that restrict religious beliefs or practices. The GRI is comprised of 20 measures of restrictions, including efforts by governments to ban particular faiths, prohibit conversions, limit preaching or give preferential treatment to one or more religious groups.

APPENDIX B: REGRESSION ANALYSIS OF THE PRIMARY INDICATORS

This appendix summarizes our empirical analysis of the various relationships between the primary indicators of the Fordham Francis Index (FFI) and select development targets of various UN Sustainable Development Goals (SDGs). These targets include: poverty, infant mortality, maternal mortality, sanitation, income inequality, and corruption. We computed our results by using simple linear Ordinary Least Squares regression techniques. Each box in Table 13 below reports the estimated coefficient between a SDG target and a FFI indicator. The precise definitions of these targets and indicators are given in appendix A. Reported below each coefficient are the t-statistic and R^2 for each analysis. The boxes highlighted in yellow in table 13 below represent all significant relationships with a 95% or greater level of confidence as determined by the value of their t-statistic. The interval of t-statistics with 95% or greater statistical confidence is:

$$1.96 \leq |t\text{-statistics}| < 2.58,$$

while the interval of t-statistics with 99% or greater statistical confidence is::

$$2.58 \leq |t\text{-statistics}| .$$

R^2 is the percentage of variation in the target that is explained by changes in the indicator. A low .R^2 could imply that the result is invalid until the effect of other explanatory variables are taken into account.

In future years we will expand the number of SDG targets that we will analyze. Eventually we will also utilize more advanced empirical techniques to analyze those relationships with low R^2's to see if our initial results are upheld.

Table 13: Table of the regression results for each of the primary indicators on the SDG targets

SDG Targets	Primary Indicators						
	Water coefficient (t-stat), R^2	Food coefficient (t-stat), R^2	Housing coefficient (t-stat), R^2	Employment coefficient (t-stat), R^2	Education coefficient (t-stat), R^2	Gender equality coefficient (t-stat), R^2	Religious Freedom coefficient (t-stat), R^2
SDG 1: No Poverty							
Level above the Poverty line	1.1	61.6	0.7	-0.5	0.6	-0.06	-2.0
	(8.41), 0.49	(7.2), 0.42	(7.92), 0.52	(-1.29), 0.02	(6.6), 0.42	(-0.26), 0.001	(-1.60), 0.04
SDG 3: Good Health							
Maternal Mortality	-12.88	-544.6	-0.65	2.22	-901.7	-0.14	24.51
	(-8.78), 0.52	(-6.58), 0.24	(-9.64), 0.52	(0.73), 0.003	(-10.8), 0.53	(-0.05), 0.00	(2.43), 0.06
Infant Mortality	-1.2	-59.9	-0.7	0.13	-88	-0.1	0.9
	(-9.63), 0.57	(-7.9), 0.31	(-9.36), 0.52	(0.45), 0.001	(-11.9), 0.57	(-0.40), 0.002	(0.98), 0.01
SDG 6: Clean Water and Sanitation							
Access to Sanitation	1.64	85.6	0.85	-0.77	1.2	0.1	-2.99
	(10.99), 0.63	(9.2), 0.38	(9.64), 0.53	(-1.9), 0.02	(11.9), 0.58	(0.31), 0.001	(-2.39), 0.05
SDG 15: Peace, Justice, and Strong Institutions							
Corruption Index	0.47	39.97	0.09	0.38	27.8	-0.01	1.5
	(5.32), 0.29	(5.65), 0.19	(1.95), 0.04	(1.03), 0.01	(3.8), 0.13	(-0.09), 0.00	(2.32), 0.05
SDG 10: Reduced Inequalities							
Equality in Income (inverse of the gini coefficient)	0.08	0.0	0.09	0.25	-0.01	-0.2	-1.4
	(0.88), 0.01	(0.61), 0.007	(0.38), 0.002	(1.62), 0.02	(-0.25), 0.001	(-1.82), 0.05	(-2.57), 0.07

APPENDIX C: TEN LOWEST RANKED COUNTRIES: MWI AND SWI

Country	Material Index	Water	Housing	Food	Employment
Ethiopia	0.202	0.486	0.01	0.406	0.845
Haiti	0.206	0.511	0.629	0.01	0.557
Namibia	0.282	0.888	0.616	0.211	0.055
Central African	0.326	0.635	0.159	0.165	0.682
Mozambique	0.328	0.435	0.251	0.552	0.193
Zambia	0.344	0.592	0.377	0.082	0.757
Niger	0.347	0.517	0.034	0.901	0.926
Chad	0.427	0.433	0.273	0.342	0.82
Gambia	0.435	0.887	0.733	0.992	0.056
Swaziland	0.479	0.702	0.934	0.545	0.147

Country	Spiritual index	Religious Freedom	Education	Gender
Niger	0.121	0.846	0.010	0.208
Egypt	0.125	0.088	0.705	0.031
Yemen	0.145	0.484	0.631	0.010
Vanuatu	0.192	0.868	0.817	0.010
China	0.267	0.055	0.942	0.367
Benin	0.270	0.956	0.157	0.132
Haiti	0.273	0.791	0.393	0.066
Maldives	0.284	0.253	0.981	0.092
Myanmar	0.284	0.286	0.916	0.088
Nigeria	0.286	0.527	0.421	0.105

APPENDIX D: FORDHAM FRANCIS INDEX COUNTRY RANKINGS

Rank	Country	FFI	Material Index	Water	Housing	Food	Employment	Spiritual index	Religious Freedom	Education	Gender
1	Bolivia	0.84	0.83	0.88	0.81	0.75	0.89	0.85	0.79	0.93	0.83
2	Argentina	0.83	0.93	0.99	0.98	1.00	0.77	0.74	0.73	0.98	0.57
3	Trinidad and Tobago	0.83	0.94	0.94	1.00	0.94	0.90	0.73	0.88	0.99	0.45
4	Philippines	0.79	0.87	0.90	0.98	0.81	0.79	0.72	0.92	0.96	0.43
5	Mexico	0.79	0.95	0.96	0.99	1.00	0.85	0.65	0.51	0.94	0.59
6	Guyana	0.77	0.85	0.97	0.98	0.87	0.63	0.70	0.87	0.82	0.49
7	Nicaragua	0.76	0.82	0.85	0.84	0.74	0.84	0.71	0.71	0.74	0.66
8	Croatia	0.74	0.82	1.00	1.00	1.00	0.45	0.68	0.85	0.99	0.37
9	Honduras	0.73	0.86	0.89	0.88	0.85	0.83	0.63	0.71	0.85	0.40
10	Colombia	0.73	0.87	0.90	0.97	0.90	0.71	0.62	0.82	0.93	0.31
11	Sao Tome and Principe	0.73	0.85	0.97	0.99	0.97	0.57	0.63	0.98	0.88	0.29
12	South Africa	0.73	0.65	0.92	0.95	1.00	0.21	0.82	0.91	0.93	0.65
13	Peru	0.73	0.88	0.84	0.89	0.93	0.87	0.60	0.68	0.93	0.35
14	Albania	0.72	0.80	0.94	1.00	1.00	0.44	0.65	0.89	0.97	0.31
15	Moldova	0.72	0.93	0.87	0.99	1.00	0.88	0.55	0.62	0.99	0.28
16	Paraguay	0.71	0.89	0.96	0.91	0.87	0.81	0.57	0.86	0.94	0.23
17	Cameroon	0.71	0.75	0.72	0.58	0.89	0.87	0.67	0.93	0.66	0.49
18	Suriname	0.71	0.90	0.94	0.98	0.93	0.78	0.55	0.98	0.94	0.18
19	Montenegro	0.70	0.81	1.00	1.00	1.00	0.43	0.61	0.84	0.98	0.27
20	Dominican Republic	0.70	0.78	0.83	0.99	0.84	0.54	0.63	0.84	0.90	0.33
21	Tunisia	0.69	0.83	0.97	1.00	1.00	0.50	0.57	0.48	0.77	0.49
22	Brazil	0.69	0.94	0.98	1.00	1.00	0.79	0.50	0.92	0.90	0.16
23	Cambodia	0.68	0.85	0.69	0.95	0.79	1.00	0.55	0.74	0.69	0.32
24	Vietnam	0.67	0.93	0.96	0.98	0.86	0.95	0.49	0.33	0.92	0.38
25	Hungary	0.67	0.93	1.00	0.99	1.00	0.76	0.48	0.69	0.99	0.16
26	Kyrgyzstan	0.67	0.89	0.88	0.99	0.98	0.75	0.50	0.34	0.99	0.37
27	Guatemala	0.65	0.85	0.92	0.81	0.78	0.91	0.50	0.77	0.78	0.21

Appendix D: Fordham Francis Index Country Rankings

Rank	Country	FFI	Material Index	Water	Housing	Food	Employment	Spiritual index	Religious Freedom	Education	Gender
28	Ghana	0.65	0.90	0.86	0.91	1.00	0.84	0.47	0.91	0.66	0.17
29	Georgia	0.65	0.87	1.00	1.00	0.94	0.61	0.48	0.60	1.00	0.19
30	Senegal	0.65	0.72	0.74	0.61	0.88	0.67	0.58	0.88	0.32	0.69
31	Zimbabwe	0.64	0.65	0.74	0.74	0.39	0.84	0.63	0.63	0.81	0.49
32	Gabon	0.64	0.74	0.92	0.91	1.00	0.36	0.55	0.89	0.79	0.23
33	Macedonia	0.63	0.57	0.99	1.00	1.00	0.11	0.69	0.65	0.97	0.52
34	Mongolia	0.63	0.71	0.59	0.90	0.65	0.75	0.55	0.73	0.98	0.23
35	Lesotho	0.61	0.57	0.79	0.72	0.87	0.21	0.65	0.92	0.71	0.42
36	Rwanda	0.60	0.50	0.72	0.24	0.41	0.90	0.73	0.62	0.63	1.00
37	Togo	0.60	0.74	0.57	0.82	0.83	0.79	0.49	0.79	0.53	0.28
38	Thailand	0.59	0.97	0.97	1.00	0.94	0.98	0.36	0.52	0.93	0.10
39	Angola	0.57	0.50	0.41	0.26	0.78	0.79	0.64	0.70	0.66	0.58
40	United Republic of Tanzania	0.57	0.50	0.49	0.32	0.41	0.94	0.65	0.66	0.74	0.56
41	Azerbaijan	0.57	0.92	0.84	0.99	1.00	0.85	0.35	0.18	1.00	0.24
42	Iraq	0.57	0.72	0.85	0.97	0.62	0.52	0.45	0.30	0.76	0.40
43	Uganda	0.56	0.57	0.76	0.27	0.57	0.94	0.55	0.47	0.65	0.55
44	Bangladesh	0.55	0.69	0.84	0.42	0.75	0.87	0.44	0.53	0.53	0.31
45	Malawi	0.55	0.61	0.87	0.31	0.67	0.80	0.50	0.88	0.54	0.26
46	Bhutan	0.55	0.95	1.00	0.90	1.00	0.92	0.32	0.51	0.49	0.13
47	Madagascar	0.55	0.61	0.43	0.84	0.41	0.96	0.50	0.66	0.58	0.32
48	Uzbekistan	0.55	0.94	0.85	0.99	0.97	0.95	0.32	0.10	1.00	0.34
49	India	0.54	0.76	0.93	0.52	0.78	0.89	0.39	0.51	0.64	0.18
50	Indonesia	0.53	0.89	0.85	0.97	0.95	0.81	0.32	0.13	0.94	0.26
51	Kenya	0.53	0.59	0.57	0.51	0.65	0.63	0.49	0.57	0.67	0.30
52	Sri Lanka	0.53	0.84	0.95	0.97	0.62	0.86	0.33	0.45	0.90	0.09
53	Congo	0.52	0.64	0.73	0.70	0.49	0.68	0.43	0.88	0.76	0.12
54	Maldives	0.52	0.95	0.98	1.00	0.98	0.84	0.28	0.25	0.98	0.09
55	Belize	0.51	0.88	0.99	0.98	0.97	0.63	0.30	0.87	0.65	0.05
56	Tajikistan	0.51	0.63	0.70	0.91	0.39	0.66	0.42	0.27	1.00	0.26

Appendix D: Fordham Francis Index Country Rankings

Rank	Country	FFI	Material Index	Water	Housing	Food	Employment	Spiritual index	Religious Freedom	Education	Gender
57	Ivory Coast	0.51	0.78	0.79	0.80	0.82	0.70	0.34	0.86	0.30	0.15
58	Turkey	0.51	0.91	1.00	0.98	1.00	0.69	0.29	0.11	0.95	0.23
59	Guinea Bissau	0.51	0.55	0.74	0.24	0.64	0.79	0.47	0.96	0.51	0.21
60	Pakistan	0.51	0.73	0.90	0.60	0.64	0.83	0.35	0.29	0.47	0.32
61	Burkina Faso	0.50	0.63	0.79	0.33	0.67	0.90	0.40	0.96	0.23	0.30
62	Myanmar	0.50	0.87	0.78	0.93	0.79	0.98	0.28	0.29	0.92	0.09
63	China	0.49	0.91	0.94	0.96	0.90	0.86	0.27	0.05	0.94	0.37
64	Mauritania	0.49	0.63	0.51	0.46	0.98	0.68	0.38	0.40	0.36	0.39
65	Sierra Leone	0.49	0.59	0.56	0.38	0.63	0.92	0.40	0.91	0.38	0.19
66	Nigeria	0.47	0.79	0.63	0.69	0.96	0.93	0.29	0.53	0.42	0.10
67	Benin	0.46	0.77	0.74	0.52	0.93	0.97	0.27	0.96	0.16	0.13
68	Liberia	0.45	0.56	0.71	0.38	0.42	0.89	0.36	0.85	0.33	0.17
69	Mozambique	0.44	0.33	0.43	0.25	0.55	0.19	0.59	0.82	0.42	0.61
70	Namibia	0.44	0.28	0.89	0.62	0.21	0.05	0.68	0.92	0.87	0.38
71	Afghanistan	0.44	0.66	0.48	0.97	0.56	0.73	0.29	0.29	0.19	0.43
72	Swaziland	0.43	0.48	0.70	0.93	0.55	0.15	0.39	0.77	0.80	0.10
73	Guinea	0.43	0.63	0.73	0.37	0.75	0.78	0.29	0.63	0.12	0.34
74	Vanuatu	0.42	0.90	0.92	0.89	0.97	0.84	0.19	0.87	0.82	0.01
75	Gambia	0.41	0.44	0.89	0.73	0.99	0.06	0.38	0.80	0.46	0.15
76	Mali	0.40	0.52	0.71	0.14	1.00	0.74	0.31	0.95	0.21	0.15
77	Chad	0.40	0.43	0.43	0.27	0.34	0.82	0.38	0.82	0.28	0.23
78	Zambia	0.39	0.34	0.59	0.38	0.08	0.76	0.44	0.65	0.80	0.17
79	Central African Republic	0.33	0.33	0.64	0.16	0.16	0.68	0.33	0.75	0.25	0.20
80	Egypt	0.33	0.87	0.99	0.97	1.00	0.58	0.12	0.09	0.71	0.03
81	Ethiopia	0.29	0.20	0.49	0.01	0.41	0.85	0.42	0.60	0.28	0.44
82	Yemen	0.28	0.55	0.48	0.75	0.56	0.44	0.15	0.48	0.63	0.01
83	Haiti	0.24	0.21	0.51	0.63	0.01	0.56	0.27	0.79	0.39	0.07
84	Niger	0.20	0.35	0.52	0.03	0.90	0.93	0.12	0.85	0.01	0.21

APPENDIX E: PARAMETERS FOR THE INDICATORS

	Food	Education	Water	Employment	Religious Freedom	Gender	Housing
Year/Country of the Minimum	2014 Haiti	2012 Niger	1990 Ethiopia	2014 Solomon Islands	2013 China	2013 Vanatu, Qatar	2013 Ethiopia
Year/Country of the Maximum	2014 Multiple countries	2014 Solomon Islands	Multiple years Multiple countries	2012 Cambodia	2014 New Zealand	2013 Rwanda	Multiple years Multiple countries

APPENDIX F: SOURCES

DATA SOURCES

Water Indicator: Improved Drinking Water
WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
https://washdata.org/data

Food Indicator: Prevalence of Undernourishment
Food and Agriculture Organization (FAO)
http://faostat.fao.org/beta/en/#data/FS

Housing Indicator: Flooring
Oxford Poverty & Human Development Initiative
http://www.ophi.org.uk/multidimensional-poverty-index/mpi-resources/#2014

Employment Indicator: Unemployment
World Bank
Unemployment: http://data.worldbank.org/indicator/SL.UEM.TOTL.ZS

Education Indicator: Adult Literacy Rate
UNESCO/World Bank
http://databank.worldbank.org/data/reports.aspx?source=2&series=SE.ADT.LITR.ZS&country=#

Gender Indicator: Women in Parliament
Inter-Parliamentary Union (IPU)
www.ipu.org
o*r*
World Bank
http://data.worldbank.org/indicator/SG.GEN.PARL.ZS?page=5

Religious Freedom Indicator: Government Restrictions Index
Pew Research Center
http://www.pewforum.org/2016/06/23/trends-in-global-restrictions-on-religion/

Sustainable Development Goals (SDG): Targets

Maternal Mortality

World Bank
http://data.worldbank.org/indicator/SH.STA.MMRT

Infant Mortality

World Bank
https://data.worldbank.org/indicator/SP.DYN.IMRT.IN

Poverty

World Bank
http://iresearch.worldbank.org/PovcalNet/index.htm

Inequality in Income

UNDP Human Development Index
http://hdr.undp.org/en/indicators/101706

Corruption Index

Transparency International
Corruption Index: http://www.transparency.org/cpi2014/results

Improved Sanitation

WHO/UNICEF Joint Monitoring Programme (JMP) for Water Supply and Sanitation
https://washdata.org/data

PHOTO CREDITS

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  https://www.usaid.gov/news-information/photo-gallery
  https://www.flickr.com/photos/usaid_images/
- Mr. Armand Aquino, IPED 2016, also design of the FFI logo.
- Fordham IPED Stock Photos

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