

Appendix C: Full Methodology

This appendix details the methods used in this study to project changes in the population size and geographic distribution of eight major religious groups from 2010 to 2050. It is organized in five sections. The first section explains how the baseline (2010) religious composition estimates were derived. The second section describes how key input data (age and sex composition, fertility, mortality, migration and religious switching) were gathered and standardized. The third part of this appendix introduces the projection methods and assumptions. The fourth section offers some important disclaimers about these projections. And the final part includes additional notes about the regional categories used in this study; explains how China's religious composition was estimated; and discusses differences between the current estimates and those in previous Pew Research Center religious demography reports.

Estimating Religious Composition in 2010

Data Collection and Documentation

Researchers acquired and analyzed religious composition information from about 2,500 data sources, including censuses, demographic surveys, general population surveys and other studies – the largest project of its kind to date. Censuses were the primary source for religious composition estimates in 90 countries, which together cover 45% of all people in the world.⁷² Large-scale demographic surveys were the primary sources for an additional 43 countries, representing 12% of the global population. General population surveys were the primary source of data for an additional 42 countries, accounting for 37% of the global population.

Together, censuses or surveys provided estimates for 175 countries, representing 95% of the world's population. In the remaining 59 countries, representing 5% of the world's population, the primary sources for the religious composition estimates include population registers and institutional membership statistics reported in the World Religion Database and other sources. A list of the primary sources used to estimate the overall religious composition of each country is provided in Appendix D.

Censuses and nationally representative surveys can provide valid and reliable measures of religious landscapes when they are conducted following the best practices of social science research. Valid measurement in censuses and surveys also requires that respondents are free to provide information without fear of negative governmental or social consequences. However, variation in methods among censuses and surveys (including sampling, question wording, response categories and period of data collection) can lead to variation in results. Social, cultural or political factors also may affect how answers to census and survey questions are provided and recorded.

The measure of religious identity in this study is sociological rather than theological. In order to have statistics that are comparable across countries, the study attempts to count individuals who self-identify with each religion. This includes people who hold beliefs that may be viewed as unorthodox or heretical by others who claim the same religion. It also includes people who do not regularly practice the behaviors prescribed by their religion, such as those who seldom pray or attend worship services.

⁷² Census data were among the sources considered for many other countries. In some countries that collect ethnic group data but not religion data on their census, the census was an important secondary resource. For example, in Russia and China, certain ethnic populations are predominantly Muslim, so the size of these groups is a useful indicator of the size of the Muslim population in each country.

Standardization of Religious Categories and Measurement Strategies

At least three researchers worked together to produce each country's religious composition estimates, observing the general procedures and considerations described below.

Pew Research Center staff standardized religion categories in all available censuses and surveys for each country. Censuses and surveys collect information on religious identity at different levels of specificity. For example, depending on the source, the most specific level of affiliation measured could be Christian, Protestant, Baptist or Southern Baptist. Researchers coded religious identities into standard categories that aggregate into the eight major global religious categories used in this report.

Identifying Primary Source(s) for Religious Composition Estimates

After considering all evidence available, researchers identified one or more primary sources for each country's religious composition estimate. Researchers sought a recent, reliable source – ideally, a census or large-scale demographic survey. Researchers favored sources in which religion was measured with a single question that permitted respondents to identify specific affiliations or no affiliation at all.⁷³

Nationally representative surveys were occasionally chosen as a primary source rather than a census or demographic survey due to limitations in the measurement of religion in the latter sources. In Vietnam, for example, the 2009 census and the 2005 Demographic and Health Survey did not adequately measure folk religion identities. Researchers instead relied on the 2005 Asian Barometer survey, which measured a wider range of religious identities, including identification with folk religions.

Making Adjustments for Groups Not Adequately Measured

As necessary, researchers made adjustments to the primary source(s) to account for omitted or underrepresented groups since small minority groups are sometimes not measured or not reported in surveys and censuses. Multiple survey sources, denomination counts and estimates produced by country experts for each nation were used to assess whether minority religious groups were omitted or undercounted in the selected primary source(s).

⁷³ The wording of religious identity questions varies across censuses and surveys, but the ideal measure is a direct one-step question, such as "What is your religion?" In contrast, many European surveys use a two-step question, such as, "Are you religious? If yes, what is your religion?" Two-step questions do not correspond well with census religion questions, which are usually one-step, direct measures. Furthermore, in many countries, two-step questions seem to filter out many respondents who might otherwise claim a religious identity but who do not consider themselves as having a significant level of religious commitment. For further discussion see Hackett, Conrad. 2014. "Seven things to consider when measuring religious identity." Religion. <http://www.tandfonline.com/doi/abs/10.1080/0048721X.2014.903647>.

In cases where censuses and surveys lacked sufficient detail on minority groups, the study also drew on estimates provided by the World Religion Database, which takes into account other sources of information on religious affiliation, including statistical reports from religious groups themselves.

Adjusting for Limitations in a Survey Questionnaire

Usually, researchers assumed that members of underrepresented groups were included in the sample but were not adequately measured by the survey instrument. Adjustments frequently were made among people who responded “other religion” or failed to answer the religion question. In a few cases, the study made adjustments based on evidence that political, legal or cultural dynamics in a country compromised the validity of self-reported religious identity.

In India, for instance, there is evidence of a Christian undercount in the census; some Christians who belong to Scheduled Castes (historically referred to as Untouchables or Dalits) choose to identify as Hindu when completing official forms such as the census.⁷⁴ This is due to a mandate in the Indian constitution specifying that only Hindus, Sikhs and Buddhists can receive caste-based government affirmative-action benefits (known as reservations in India).⁷⁵ After analyzing Indian survey data and convening a special consultation on this topic with leading India demographers at the 2010 Asian Population Association’s meeting in New Delhi, researchers adjusted the Christian population of India’s 2001 population from 2.3% to 2.6%, assuming a 10% undercount in the census.⁷⁶ In this case, the adjustment comes from the Hindu category. (Hinduism is the most common religion in India.)

Adjusting for Sampling Limitations

In some situations, underrepresented groups are likely to be omitted from the sample itself. For example, recent migrants who may not be fluent in the language used in a survey often are missing in samples. Accounting for groups not included in the sample requires proportionately deflating survey data to account for underrepresented populations. For example, researchers made adjustments to survey-based estimates in Europe where they found evidence that some survey samples and population registers underrepresented Muslim migrants.

74 This phenomenon is discussed in Kumar, Ashok M. and Rowena Robinson. 2010. “Legally Hindu: Dalit Lutheran Christians of Coastal Andhra Pradesh” in Rowena Robinson and Joseph Marianus Kujur, editors. “Margins of Faith: Dalit and Tribal Christianity in India.” Sage Publications.

75 Ministry of Social Justice and Empowerment, Government of India. “Scheduled Caste Welfare – Frequently Asked Questions.” <http://socialjustice.nic.in/faqs1.php#sc4>.

76 Religion results from India’s 2011 census were not available during our data analysis period. Official results had still not been released as of March 6, 2015, though results were expected to be released shortly. Note that the 2001 census figures are projected forward to the 2010 baseline year of this report, as described subsequently.

In this study, researchers sought to ensure that primary sources were representative of the entire country. When this was not the case, it was usually due to concerns about the safety of interviewers and census takers or disputes about political boundaries. In such cases, researchers attempted to make appropriate adjustments or find an alternative data source that was nationally representative.

For example, the 2001 Sri Lankan census was not conducted in a handful of northern and eastern districts because of perilous conditions due to armed conflict. After analyzing religion data from earlier censuses, researchers determined that the areas that were not covered by the 2001 census historically had a different makeup than the rest of the country. Researchers adjusted the 2001 census data for Sri Lanka based on 1981 census data covering regions omitted in the 2001 census.⁷⁷

Religious identity is sometimes linked to ethnic identity, particularly for religious minorities. In a small number of countries where the census did not measure religious affiliation or where survey data on religious affiliation had sampling limitations, researchers used ethnicity data to estimate the religious affiliation of small groups. For example, ethnicity data from the 2002 Russian census was used together with 2005 Generations and Gender Survey data to estimate the proportion of Muslims in Russia. The survey did not adequately sample the country's predominantly Muslim areas, but it did provide information on the share of Muslims within ethnic groups associated with Islam.⁷⁸ This information, combined with census ethnicity data, was used to adjust the Muslim composition estimate in regions the survey sampled inadequately.

Making Adjustments for the Religious Affiliation of Infants

Parents are sometimes hesitant to report a religious affiliation for their infant children even though they will claim a religion for the child when he or she is slightly older. Researchers observed evidence of this phenomenon in some Christian-majority countries where Christian parents were disproportionately describing their infants as religiously unaffiliated.

This is evident when comparing census numbers over multiple years. In Brazil, for example, the 2000 census reported that 11% of those ages 0-4 were unaffiliated. By the time of the 2010 census, only 8% of the same birth cohort (then 10 to 14 years old) was unaffiliated. While some of this change may be explained by mortality and migration, it is at least partly due to parents being more willing to describe their older children as Christians.

⁷⁷ There was no census in Sri Lanka in 1991.

⁷⁸ Ethnicities with close links to Muslim identity include Tatar, Bashkir, Chechen, Avar, Azeri, Kazakh, Kabardian, Ossetian, Dargin, Kumyk, Ingush, Lezgin, Karachay, Adyghe, Balkar and Circassian.

In order to compensate for this measurement bias in Brazil and a few other countries where there was evidence of this phenomenon, researchers applied the religious composition of older children (those 5-9 years old) to infants and young children (those 0-4 years old). This adjustment was made only where there was a substantial difference between the religious composition of the youngest age group and children ages 5-9.⁷⁹

Making Adjustments for Missing Religion Data

Some degree of missing data is found in most surveys and censuses. Census agencies typically make adjustments for missing data before reporting results. For example, though some respondents fail to answer questions about sex and age, census agencies follow procedures to impute missing values so it is not necessary to report “sex not stated” and “age not stated” as sex and age categories. Some census agencies, such as Statistics Canada, have historically imputed religion values for respondents who have not answered the census religion question.

The likelihood that religion data will be missing increases when religion questions are labeled as optional, as is the case on censuses in countries such as Australia, the United Kingdom and the Czech Republic.⁸⁰ Census agencies in countries where religion is labeled as an optional question often report “religion not stated” results alongside standard categories of affiliation and non-affiliation. This strategy allows the census agencies to demonstrate that answering their religion question was indeed optional. However, for purposes of this study, the “religion not stated” category is not a meaningful religious identity. Therefore, after making any necessary adjustments for undercounted groups, religious shares were recalculated based on the population of all people who gave valid responses to the census or survey. The effect of this approach was to proportionately raise the shares of all religious groups, including the religiously unaffiliated.

Following the procedures described above, researchers produced national-level estimates of the religious composition of each country for the year measured by the primary source. In order to report 2010 population figures, the religious composition percentages based on data collected in 2008 or later have been multiplied by the United Nations’ 2010 population estimate for each country and territory.

79 This adjustment was made in Australia, Belize, Brazil, Mexico, New Zealand, the Philippines, Sierra Leone and South Korea.

80 The religion question became optional in the 2011 Czech Republic census. In that census, nearly half (45%) of Czech respondents did not state their religion. In other cases, non-response rates were more modest. For example, religion was not stated for about 8% of respondents in the 2011 Australian census.

Projecting Earlier Data to 2010

Estimates based on data collected prior to 2008 have been projected forward to 2010. In those cases, researchers used additional data on differential fertility, age and sex composition as well as migration to project populations forward to 2010, the base year for the projections in this report. Additional information about the projections to 2010 and the estimates of religious composition are available in Appendix A of the 2012 Pew Research Center report “The Global Religious Landscape: A Report on the Size and Distribution of the World’s Major Religious Groups as of 2010.” See <http://www.pewforum.org/files/2012/12/globalReligion-appA.pdf>.

The 2010 religious composition used for each country generally matches the estimates used in the 2012 report, except in cases where new sources, including recently released census data, allowed researchers to update estimates.

Input Data for Population Projections

The demographic projections in this report use data on age and sex composition, fertility, mortality, migration and religious switching. This section describes how these data were gathered and standardized for use in the projections.

Age and Sex Structure Procedures

Religious affiliation varies by age.⁸¹ In this section, the phrase “age structure” is used as shorthand to refer to the religious composition of age-sex groups. In order to calculate the median ages of religious groups and carry out population projections, researchers assembled age structures for each of the eight religious groups in every country. Data on age structures were collected in 20 age categories (measured in five-year increments with a top value of 95 and above) for males and females (e.g., males ages 15-19), resulting in a total of 40 categories.

Age structures were compiled in three steps. First, census or survey data were used to capture the religious affiliation of each available age group. Second, survey data on religion by age were adjusted to account for small sample sizes. And third, results were adjusted to match the religious breakdown by age and sex with each country’s overall religious composition. These steps are described in detail below.

Estimating Religion by Age and Sex

Researchers constructed initial age structures by analyzing survey data sets, census data sets and tables published by census agencies. While censuses usually enumerate religion for the entire population, including children, general population surveys do not usually include interviews with children. Since age structures require religious affiliation data for children, children were assigned religious affiliations when necessary based on the best methods available. For data sets that measured religious affiliation only for adult respondents, yet included the number and ages of children (and other adults) in the household, researchers were able to estimate the religious affiliation of remaining household members. In most cases, the religious affiliation of the respondent or head of the household was assigned to

81 The religious affiliation of young people often differs from the affiliation of the older population due to religious switching, migration and variation in childbearing patterns by religion.

all additional members of the household who were not surveyed.⁸² For surveys that did not offer household information, such as the AmericasBarometer or the European Values Study, children were assigned a religious affiliation based on the fertility patterns and religious affiliation of women of childbearing age, as well as information about the religious affiliation of the youngest respondents measured in the survey.

For many countries, reliable age data were not available for all eight religious groups. Sometimes a survey indicated the overall size of a small religious group yet lacked sufficient numbers to reliably estimate the group's age breakdown. In such cases, the age breakdowns of minority religious groups were based on the country's overall age distribution or the combined age distribution of respondents from all minority religions in a survey.

Adjustments to Minimize Errors Due to Sample Size

The reliability of survey estimates is partly dependent on the number of people surveyed (the sample size). Since respondents who identify with each religious group are divided into 40 age and sex categories, the number of Buddhists, for example, in any one age-sex category may be small and produce less reliable estimates than a larger count would produce. This introduces significant variation in patterns of religious affiliation by age: Affiliation levels may bounce between highs and lows for consecutive age groups. To eliminate unlikely variation, researchers smoothed data using statistical procedures intended to reveal the general underlying pattern.⁸³

Census data are not smoothed because census data represent a complete enumeration of all individuals living in a country. However, in some cases, the age categories reported by census agencies are in 10-year age groups or aggregated for all adults above a certain age, such as 60. Researchers used statistical modeling techniques to distribute the composition of these aggregated age groups across the more specific five-year age categories used in this study.

82 Some demographic surveys, such as the Demographic and Health Surveys, ask the religious affiliation question only to members of the household who are in their reproductive years (usually between 15 and 49 years of age for women). Procedures used to assign religious affiliations to individuals in the Demographic and Health Surveys were validated against census data that enumerated all individuals in the country. Results of this validation exercise from Brazil, Ghana and Mozambique – countries that had both census data and data from Demographic and Health Surveys – were presented at the 2011 annual meeting of the Population Association of America. (Andrew Gully and Noble Kuriakose. “Can DHS Household Files be Used to Provide an Accurate Estimate of the Market Share and Age Structure of Large Religious Groups?”)

83 Most smoothing methods rely on using multiple points on the x-axis that are below and above the current point (in this case, points refer to religious shares within age groups) to produce a new value. For example, the religious affiliation shares of those ages 80-84 and 90-94 were taken into account in order to smooth the affiliation shares of those ages 85-89.

Matching Religion by Age and Sex to Overall Population by Age and Sex

The overall religious affiliation resulting from the age structure procedures sometimes varies from the religious composition estimated for the country using the procedures described in the first section of this appendix. This difference exists for two reasons. First, the data sources used for the age-structure procedure may be different from the data sources used for the religious composition. Second, overall religious compositions were adjusted manually to account for undercounts and sampling issues.

In order to match the overall religious composition figures to the data on religion by age and sex, the age structure was adjusted. The adjustment procedure used is often referred to as iterative proportional fitting (IPF), or raking. Raking makes adjustments to the percentages of religious affiliation for each age group without significantly altering the underlying religious affiliation patterns by age group. Additionally, raking is used to match each country's counts of males and females in particular age groups to the U.N.'s estimate of the country's overall age distribution.

When survey or census data on the differential religious composition of age-sex groups were not available, each age-sex group was assigned the same religious composition. Lack of differential religious composition data by age-sex group was most common in countries with very small populations.

Sources for Age and Sex Structure Data

As mentioned above, the data source used for a country's age structure is sometimes different from the source used for the country's overall religious composition (see Appendix B on page 195 for a list of religious composition sources by country). This is the case, for example, when census data with overall religious composition results are available but a detailed breakdown by age and sex is not released by the census bureau, in which case another source must be used to generate the age structure. Sources are also different when multiple waves of a survey series have to be combined in order to have a sample size large enough to construct reliable age structures.

Age structures were further adjusted in countries where the age structure data source is much older than the source used for the religious composition of the country. In order to harmonize the data on overall religious affiliation with the age structure data, the latter is aged in five-year projections while holding the religious composition data constant.

In a small number of countries, age structures were estimated based in part on ethnicity

or citizenship data. For example, all six Gulf Cooperation Council (GCC) countries release information on the age distribution of citizens and non-citizens, but only Bahrain further breaks down this information by Muslims and non-Muslims.⁸⁴ For this reason, age distribution estimates for citizens and non-citizens in other GCC countries are modeled on Bahrain, where almost all citizens are Muslim but a substantial share of non-citizen residents (mostly migrant workers) belong to other faiths.

Estimating Fertility

In many countries, there are substantial differences in the number of children born to women in different religious groups. Furthermore, religious groups often vary in the share of women in their population who are of childbearing age, and women in some groups may, on average, begin having children at younger or older ages than do women in other groups. These differences in childbearing patterns, age structure and fertility timing combine to produce differences in the rates at which babies are born to adherents of the world's major religions.

Fertility data were gathered from censuses and surveys, and fertility rates were estimated via direct and indirect measures. Some censuses and surveys directly measure recent births or the number of children a woman has ever born by the time of the survey. In other cases, fertility data were gathered indirectly; for example, by using data on the age of a mother's children to estimate her past birth patterns. These various sources of fertility data were used to estimate age-specific and Total Fertility Rates for religious groups in each country.⁸⁵

In many countries, data on differential fertility are available for the largest religious groups but sufficient detail is not available for all minority religious groups. In Nigeria, for example, more than 98% of women of reproductive age are either Christian or Muslim, and there are sufficient data for estimating fertility for these two groups. For other groups in Nigeria, however, researchers had to base estimates on more limited data. Similarly, there are many countries in which one religious group makes up 95% or more of the women of reproductive age, resulting in a relatively small number of women of other religions (and thus limiting fertility data for those religious groups).

In some countries, differential fertility data by religion were not available. In these cases, researchers applied prevailing national fertility rates to all religious groups equally.

84 The six Gulf Cooperation Council countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates.

85 The Total Fertility Rate (TFR) is the total number of children an average woman would have in her lifetime if fertility patterns did not change. The TFR is calculated by adding the birth rates among women in each age group in a particular country during a given period; in other words, it is a kind of snapshot of fertility patterns at one place and time.

Life Expectancy

Little research has been conducted on cross-national differences in mortality and life expectancy across religious groups. In the absence of better data, the same mortality patterns within each country are assumed for all groups; for example, Christians and Muslims born in the same year in Nigeria are assumed to have the same life expectancy at birth. Each country's projected mortality patterns are based on U.N. mortality tables for the country. At the global level, mortality rates for each group reflect differences between the countries in which the various groups are concentrated.

Estimating and Projecting the Size and Religious Composition of Migrant Flows

To model the impact of migration on future religious change, the population projections in this report required an estimate of the religious composition of recent migrant flows between countries – that is, how many migrants moving from Country X to Country Y are Christian? How many are Muslim? How many are Hindu? Etc. Data on the size and religious breakdown of migrant flows were pieced together in two steps. The first step was to estimate how many people move to and from every country in the world. Second, the religious composition of migrants moving between countries was estimated.

Generally speaking, there is much better information on migrant “stocks” (how many foreign-born people reside in each country, and where they were born) than there is on migrant “flows” (how many people move between countries each year). The limited flow data that are available may not capture all modes of travel or all kinds of international migrants, and it can be difficult to distinguish short-term travel from long-term migration. Since data on migration flows are incomplete, data on migrant stocks from the World Bank (for the year 2000) and the Pew Research Center’s Global Religion and Migration Database (for the year 2010) were used to estimate migration flows for both males and females between 2000 and 2010. (Both data sources represent a compilation of census and survey data from around the world, estimating the size of the foreign-born population in each destination country, broken down by country of origin.⁸⁶)

Flows were estimated by first approximating 2005 stocks using interpolated trends based on differences between the 2000 and 2010 migrant stock information. Second, using an innovative technique developed by researchers at the Vienna Institute of Demography, differences in foreign-born populations between 2005 and 2010 were used to estimate migration flows for 155 countries.⁸⁷ Using empirical data and observed regularities in the age patterns of migration flows, researchers were able to disaggregate each estimated total flow into subtotals by five-year age groups.

86 For more information on the Global Religion and Migration Database, see the Pew Research Center’s March 2012 report “Faith on the Move: The Religious Affiliation of International Migrants.” <http://www.pewforum.org/2012/03/08/religious-migration-exec/>.

87 For a detailed methodology for the estimation of migration flows, see Abel, Guy J. March 15, 2013. “Estimating global migration flows using place of birth data.” Demographic Research. <http://www.demographic-research.org/volumes/vol28/18/28-18.pdf>, pages 505-546. Since the decennial stock data estimated by researchers at the U.N. were not available when this project began, stock estimates in 2000 were drawn from the World Bank’s estimates, while 2010 origin-destination data were taken from the Pew Research Center’s Global Religion and Migration Database. Large refugee populations in neighboring countries were not included in the stock estimates. An extension of this methodological approach to estimating migration flows also was explained in Abel, Guy J. and Nikola Sander. March 28, 2014. “Quantifying Global International Migration Flows.” Science. <https://www.sciencemag.org/content/343/6178/1520>.

Resulting estimates of migration flows were reviewed by Pew Research Center staff to be sure all estimates represented recent migration patterns, and some adjustments were made. Several countries with a total population of less than a million people did not have recent data on migration; thus, migration flows for these smaller countries are not included in the population projections. Migration patterns to some countries changed between 2000 and 2010. Most notably, the economic crisis in the latter part of the decade slowed migration in many parts of the world. Consequently, future migration flows were reduced by 25% for most countries and up to 50% for a handful of countries.⁸⁸ Lastly, the origins of migrants can change over the course of a decade. In Israel, for example, the origins of migrants in 2000 were much different than those arriving in 2010. In this case, data containing the most recent migration flows into Israel were used. Adjustments made to migrant flows are listed by country in the appendix on data sources (see Appendix B on page 195).

The second step was to identify the religious breakdown of migrants. It is important to realize that the religious composition of migrants is not always the same as the religious composition of the general population in their country of origin. In many cases, members of some religious groups are more likely than others to leave a country, and they are also more likely to choose certain destination countries. Religious minorities, in particular, may be disproportionately likely to migrate to a country in which their religion is in the majority. For example, surveys of recent immigrants indicate that Christians from the Middle East and North Africa are more likely than Muslims from the region to move to the United States. During the 2010-2015 period, an estimated 13% of migrants to the U.S. from the Middle East-North Africa region were Christian, although only about 4% of the region's overall population was Christian as of 2010. Consequently, the religious breakdown for most of the world's movement of migrants is drawn from the Pew Research Center's Global Religion and Migration Database – a data source estimating the religious breakdown of migrant populations based on global census and survey information. The information in the database is of varying quality. But because data on the religious breakdowns of migration patterns are more readily available in the world's top destination regions (Europe, North America and some countries in the Asia-Pacific region), the religious composition estimates for the vast majority of migrants are based on data of high quality.⁸⁹

88 Migration rates in Albania, Bosnia and Herzegovina, Macedonia and Poland were reduced by 50%. Including reductions in migration flows made future levels of migration more plausible when net migration estimates were compared with estimates from the United Nations. Since future migration levels differ slightly from U.N. projections of migration, total population sizes of some countries will be slightly different than future population estimates provided by the United Nations.

89 For a detailed discussion of how the database was constructed and of data quality issues, see Appendix B of the Pew Research Center's March 2012 report, "Faith on the Move: the Religious Affiliation of International Migrants." Minor adjustments to the religious composition estimates since the publication of the 2012 report are noted in Appendix B of this report on page 195.

Using all of this information, researchers calculated migration *rates* to and from most countries by age, sex and religion.⁹⁰ Using migration rates instead of population counts allows for a more dynamic model of future migration. As countries increase or decrease in size and their religious composition changes, the migration rates will produce corresponding changes in the size and religious composition of migrant flows.

Estimating Religious Switching

Studies of religious switching indicate that this phenomenon is often concentrated in young adult years, roughly between ages 15 and 29. Change in religious affiliation may occur as young adults move away from their parents and partner with someone of a different affiliation status. While some religious switching may take place at other ages, switching is modeled as a life course phenomenon in which some young adults change their religious affiliation status. There may be some time periods during which people of all ages are prone to religious switching, such as when political circumstances in a country encourage or discourage religious identity or lack of religious identity.⁹¹ Our models do not attempt to include such period effects.

Sources of Switching Data

The typical procedure for measuring religious switching is to compare the religion in which a person grew up with their current religion (when the person is an adult). The best sources of data on religious switching are nationally representative surveys that ask adults about their current religion as well as the religion in which they were raised. In 70 countries, data are available on both the religious upbringing of survey respondents and on current adult religious identity.⁹² These surveys typically have sample sizes between 1,000 and 3,000 respondents. Data sources include cross-national surveys carried out as part of the International Social Survey Program and by the Pew Research Center, as well as some surveys carried out only in one country.⁹³ Unfortunately, while censuses and large-scale demographic surveys often measure current religious affiliation, they generally do not measure religious origins, and so they cannot be used to directly measure religious switching. (Censuses in Northern Ireland and Scotland are exceptions.)

90 Migration was not included in projections for countries with total populations of less than 1 million in 2010.

91 Furthermore, taxes on religious membership may produce distinct patterns of religious switching related to income. See McClendon, David and Conrad Hackett. 2014. "When People Shed Religious Identity in Ireland and Austria: Evidence From Censuses." Demographic Research. <http://www.demographic-research.org/volumes/vol31/43/31-43.pdf>.

92 To see a list of the 70 countries, see page 28 of the Methodology.

93 The European Values Study (EVS) also asks questions about current and prior religious affiliations. Unfortunately, the questions used in the EVS are not suitable for measuring movement between non-affiliation and affiliation. This survey does not directly measure the religion in which a respondent was raised. Instead, respondents are asked, "Where you ever a member of another religious denomination?" This question does not permit differentiation between those who switching from having no affiliation to their current affiliation and those who have always maintained the same religious affiliation. Unadjusted EVS data would not document any movement from non-affiliation to affiliation and would overestimate retention among the affiliated.

Since men and women often follow different switching patterns, researchers calculated rates of switching separately for men and women based on the experiences of adults ages 18-54 at the time of the survey. Researchers assume that the experience of young respondents is the best source of information about likely switching patterns for emerging generations, so the experiences of older respondents (those ages 55 and above) are excluded from the analysis. The analysis was initially restricted to the switching experience of 30- to 54-year-olds; while this restriction allowed the focus to be on respondents who have recently completed their young adult years, it left less-than-optimal sample sizes. Including the full range of adults ages 18-54 in the sample increased sample sizes and did not appear to compromise the reliability of the switching rates.⁹⁴

Coverage of Religious Switching Data

The 70 countries where switching was modeled in the main scenario held 43% of the world's population in 2010, including many countries where switching between having a religious affiliation and not having a religious affiliation is common, such as the United States, France, Australia and New Zealand. The most populous countries in which switching was not modeled are China and India. Prior to this study, the most extensive analysis of religious switching covered 40 countries.⁹⁵

China

It is difficult to formally project religious switching in China without information on recent or likely patterns of switching. For example, it is not clear at what rate people in China may be converting to Christianity from other groups, and retention patterns among Christian converts are not known. Nor is it clear at what rate Islam, Buddhism and other faiths may be gaining adherents in China. If China experiences a net movement toward religious affiliation via switching in the decades ahead, that would tilt the needle toward a more religiously affiliated global population, particularly since China is currently home to a majority of the worldwide unaffiliated population. (For more details on religious switching in China, see sidebar on page 55 in Chapter 1 of the report.)

94 Due to the rapid pace of religious change in the United States, the religious switching patterns of older Americans do not fully reflect recent patterns seen among younger adults. This analysis uses religious switching data for 18- to 29-year-olds from the 2010 and 2012 waves of the U.S. General Social Survey to model switching of those who grew up Christian or unaffiliated. To have sufficient sample size for those who grew up in other religious traditions, data from 18- to 54-year-olds in the Pew Research Center's 2007 Religious Landscape Survey are used.

95 Barro, Robert and Jason Hwang and Rachel McCleary. 2010. "Religious Conversion in 40 Countries." *Journal for the Scientific Study of Religion*. <http://onlinelibrary.wiley.com/doi/10.1111/j.1468-5906.2009.01490.x/abstract>, page 24.

India

Like China, India is home to more than a billion people. But unlike China, where many people have diffuse religious identities or no religious affiliation, in India the overwhelming majority of the population identifies with some religion. Religious switching has long been a sensitive subject in India, and media accounts include allegations of mass conversions, forced conversions, proselytizing, and other controversies related to religious switching, particularly from Hinduism to Christianity or Islam. However, there is very little empirical data on religious switching in the Indian population. No current, nationally representative survey of Indians provides reliable data both on respondents' childhood religion and on their current religious affiliation (the basis for calculating switching rates).⁹⁶ After analyzing Indian survey data and consulting other sources of information on the country, researchers were unable to discern a clear pattern of religious switching. As a result, this report does not estimate religious switching in India.

Other countries where religious switching was not modeled include some Muslim-majority countries with little evidence of religious change (such as Afghanistan and Bahrain), countries where religious switching data are not consistent or reliable (such as Vietnam) and countries with no data or evidence of religious activity (such as North Korea).

Muslim-Majority Countries

This analysis of religious switching draws on surveys in 19 countries where Muslims constitute a majority of the population. Generally, however, there are few reports of people disaffiliating from Islam in these countries. One reason for this may be the social and legal repercussions associated with disaffiliation in many Muslim-majority countries, up to and including the death penalty for apostasy. It is possible that in the future, these societies could allow for greater freedom to religiously disaffiliate. The demographic projections in this report do not seek to predict the likelihood of such changes in political and social dynamics, or to model what the consequences might be.

⁹⁶ The most recent, relevant data seems to be from a 1990 World Values Survey, which found that nearly all Indian residents who grew up as Hindu still identified as Hindu as adults.

Population Projections: Methods and Assumptions

The Projection Approach

The technical calculations for the projections in this report were made by researchers at the Age and Cohort Change Project of the International Institute for Applied Systems Analysis (IIASA) using an advanced variation of the standard demographic method of making population projections. The standard approach is called the cohort-component method, and it takes the age and sex structure of a population into account when projecting the population forward in time. This has the advantage of recognizing that an initial baseline population can be relatively “young,” with a high proportion of people in younger age groups (such as Nigeria) or relatively “old,” with a high proportion of older people (such as Japan).

Cohorts are groups of people that had an experience in a particular time. A birth cohort, the type of cohort referenced in this context, comprises people born in a certain period. Birth cohorts can also be described as males or females who have reached a certain age in a particular year. For example, the cohorts of females ages 15-19 in the year 2000 and males ages 15-19 in the year 2000 shared the experience of being born between 1981 and 1985.

Components are the three ways in which populations grow or shrink: new entrants via births, exits via deaths and net changes from migration. Each cohort of the population is projected into the future by adding likely gains – births and people moving into the country (immigrants) – and subtracting likely losses – deaths and people moving out (emigrants) – year-by-year. The very youngest cohorts, those ages 0-4, are created by applying age-specific fertility rates to each female cohort in the childbearing years (ages 15-49).⁹⁷

The cohort-component method has been in existence for more than a century. First suggested by the English economist Edwin Cannan in 1895, then further improved by demographers in the 1930s and '40s, it has been widely adopted since World War II. It is used by the United Nations Population Division, the U.S. Census Bureau, other national statistical offices and numerous academic and research institutions.

The advanced variant of this approach, multistate cohort component projection, became viable starting in the 1970s thanks to the availability of mainframe computers and work by the American geographer Andrei Rogers, among others. The multistate approach permits simultaneous projection of the eight religious groups included in this study, taking into

⁹⁷ The number of children ages 0-4 projected to join a population is also influenced by infant and child mortality rates and migration rates incorporated in the projection model.

account variation by religion in age, sex, childbearing patterns and propensity and direction of migration. This approach also enables modeling of religious switching as a transition between religious “states.”

Projections have been carried out for 198 countries and territories with populations greater than 100,000. The regional and global totals in the study also include estimates for 36 countries and territories that collectively made up 0.02% of the world’s population in 2010. Estimates for these low population countries and territories are based on U.N. estimates of the countries’ future population sizes; the distribution of religious identities in these countries is based on 2010 data.

Projection inputs for each country – including differential data by religion on fertility, age structure, migration and, where available, switching rates – were used for multistate cohort component projections going out to the year 2050. Country-level 2010 population data and fertility trajectories are based on the 2010 revision of the United Nations’ World Population Prospects.

The projection models assume that fertility differences between the religiously affiliated and the unaffiliated will gradually converge by the year 2110, as educational differentials between the groups disappear. The main projection scenario extends current switching rates in the 70 countries with available data.

This report focuses on the *main* scenario with fertility convergence (i.e., narrowing fertility differentials between religious groups); constant religion-specific out-migration rates by age, sex and destination matrices; and constant religious-switching rates. In order to explain the influence of demographic factors, the report also presents alternative scenarios with: (1) no differences in fertility by religious groups; (2) no migration flows between countries; (3) no religious switching between religious groups; and (4) proxy data used in 85 countries to model the effects of religious switching in a total of 155 countries.

Fertility

In the main scenario, all religious groups *within each country* are assumed to see their fertility levels slowly converging toward identical fertility rates by 2110 – a century from the baseline year of the projections. The assumption that fertility differences gradually will diminish within countries is based on evidence that when people live in the same economic and social milieu, their fertility patterns tend to become increasingly similar over time. Studies have shown, for example, that the offspring of immigrants to the United States and Europe tend to adopt the fertility patterns of the general population in the countries where they live within a few

generations. The adoption of a relatively conservative, 100-year timeframe for within-country convergence reflects the fact that geographic clustering, differing education levels and other factors may perpetuate distinctive childbearing patterns among some religious groups. At each step of the main projection scenario, fertility for the total population of a country follows the U.N. medium variant assumptions from the 2010 revision (U.N. 2011).

An alternative scenario discussed in Chapter 1 of this report assumes that there are no religion-specific differentials in fertility. In this scenario, all religious groups are assumed to have the same level and pattern of fertility as the total population of a country throughout the projection period. The changes in fertility over time follow the U.N. medium variant assumptions.

Migration

The main scenario assumes constant religion-specific out-migration rates by age, sex and destination matrices by sex and religion calculated for the baseline period; this procedure is described in the previous section. The out-migration rates are based on the 2005-2010 time period. Because of the significant drop in migration experienced during the recent financial recession after 2008, migration rates were decreased by 25% for most countries and up to 50% for a handful of countries, as noted earlier in the Methodology. This provides for a more conservative approach for migration's influence on religious change around the world. In each iterative time period of the projections, out-migration and immigration flows are calculated by age, sex and religion based on the baseline rates and destination matrices.

Another migration scenario assumes no migration in the world. By way of comparison, this scenario highlights the effect of migration on the religious composition of countries under consideration.

Religious Switching

The main projection scenario includes constant switching rates from the baseline estimates. Those rates are used to calculate the flow of people in certain age and sex groups who move from one religion to another at each five-year interval of the projections. The main scenario models switching in 70 countries for which recent estimates of switching were available. Another scenario models switching in an additional 85 countries, as described in Chapter 1. A third scenario models what would happen if people do not change their religion during their lifetimes.

In countries for which switching data are available, researchers generated recent rates of switching. The main projection model assumes that emerging cohorts will switch from their

childhood status at the same rate observed in recent survey data. As new cohorts progress from ages 15 to 29 in the projections, they experience these rates of change. For example, if 20% of the adults measured in a recent survey say that they grew up Christian but are now unaffiliated, the model projects that 20% of Christian children ages 10-14 will disaffiliate by the time they are ages 30-34.⁹⁸ The model takes into account recent patterns of switching in all directions, which may be partially offsetting.

For projection purposes, each person was allowed one switch, which is all that is directly measured in the surveys this method draws upon. Though this does not capture the complexity of individual religious identity and switching, it captures aggregate patterns of change.

Life Expectancy

Based on the United Nations' medium scenario assumptions (U.N. 2011), this study projects that life expectancy at birth will gradually increase in all countries. There is no high, medium or low assumption because each country, regardless of its current economic condition, is assumed to be moving toward better living standards and, therefore, longer life expectancy at birth. Following the 2010 revision of U.N. projection assumptions (U.N. 2011), gender-specific differences in mortality are introduced based on the U.N. assumptions of life expectancy by sex.

⁹⁸ Switching rates are applied to rising cohorts of 10- to 14-year-olds at three intervals (the transition to ages 15-19, to ages 20-24 and to ages 25-29). For example, if a survey indicated 87.5% of adults who grew up affiliated are now unaffiliated, this rate of disaffiliation would be modeled for a cohort in three steps by switching 50% of affiliated people to unaffiliated status at each of three five-year steps. With 1,000 affiliated 10- to 14-year-olds at the first step, 50% disaffiliation in five years leaves 500 affiliated 15- to 19-year-olds. In the next five years, 50% disaffiliation leaves 250 affiliated 20- to 24-year olds. In the final step, 50% disaffiliation leaves 125 affiliated 25- to 29-year-olds (87.5% of the original 1,000 children have disaffiliated). Such high rates of disaffiliation are not common and are used here only for ease of explanation.

Disclaimers

Since religious change previously has never been projected on this scale, some cautionary words are in order. Population projections are estimates built on current population data and assumptions about demographic trends, such as declining birth rates and rising life expectancies in particular countries. The projections are what will occur if the current data are accurate and the trends play out as expected. But many events – scientific discoveries, armed conflicts, social movements, political upheavals, natural disasters and changing economic conditions, to name just a few – can shift demographic trends in unforeseen ways. Because of unforeseeable events or demographic changes, the projections are limited to a 40-year time frame.

Another limitation of this study is that current patterns of religious switching are available for only 70 countries, which constitute 43% of the world's population. The most populous omissions are China and India. While there are insufficient data to directly measure individual change in religious identity in India, cohort-based analysis of Indian census and survey data does not provide evidence that switching per se is leading to net change in the size of religious groups in the country. In China, about 5% of the population is estimated to be Christian at present, and more than 50% is religiously unaffiliated. Because reliable figures on religious switching in China are not available, the projections do not contain any forecast for conversions in the world's most populous country. But if Christianity expands rapidly in China in the decades to come – as some experts on China predict – then by 2050 the global number of Christians could be significantly higher than projected, and the decline in the percentage of the world's population that is religiously unaffiliated could be even sharper.

This study does not attempt to model how religious switching patterns may change in the future as countries experience changes in education, urbanization, political governance and economic development. It is uncertain how economic growth might impact levels of religious affiliation. Economic development could be accompanied by increasing rates of religious disaffiliation in countries that currently show little movement toward disaffiliation. However, it should not be taken for granted that all countries will follow a European pattern, in which religious disaffiliation increases following advanced economic development. There is no clear precedent for this sequence in a Muslim-majority country. In Hindu-majority India, religious affiliation remains almost universal even as the country is experiencing major social changes. And while it is difficult to assess religious change in China from the available data, religious identification seems to have increased as the country has developed economically.⁹⁹

⁹⁹ For a discussion of the relationship between economic development and secularization, taking into account various forms of government and other factors, see Norris, Pippa and Ronald Inglehart. 2004. *Sacred and Secular: Religion and Politics Worldwide*. Cambridge.

Additional Notes

Sources for China Data

For most countries, estimates for the size of the eight religious groups are based on one or two primary sources. However, the estimates for China come from several sources, since data on religion in China are deficient.¹⁰⁰ The following descriptions summarize the various sources used to estimate the size of each religious group in China.

Muslims

Most Chinese Muslims belong to one of several ethnic groups that are overwhelmingly Muslim. The 2000 Chinese census included a measure on ethnicity. While not all members of these ethnic groups would necessarily identify as Muslim, the census figures provide a reasonable and generally accepted approximation of the size of China's Muslim population.

Christians

Because there is some evidence that Chinese Christians may underreport their religious identity on public opinion surveys, the Pew Research Center reviewed multiple sources to arrive at an approximation of the size of China's Christian population. For details, see [Appendix C: Methodology for China](#), in the Pew Research Center's December 2011 report "[Global Christianity](#)."

Hindus and Jews

Members of these two religious groups in China are predominantly expatriates and are relatively few in number.¹⁰¹ The Pew Research Center's estimates for Hindus and Jews in China rely primarily on the World Religion Database.

Buddhists, Adherents of Other Religions, Adherents of Folk Religions and the Religiously Unaffiliated

Estimates for these four religious groups are based on an analysis of the 2007 Spiritual Life

100 For a discussion of data challenges in China, see "Appendix C: Methodology for China," in the Pew Research Center's 2011 report. "Global Christianity: A Report on the Size and Distribution of the World's Christian Population." <http://www.pewforum.org/files/2011/12/ChristianityAppendixC.pdf>.

101 See Leslie, Donald Daniel. 1972. "The Survival of the Chinese Jews: The Jewish Community of Kaifeng." Brill.

Study of Chinese Residents by Pew Research Center staff.¹⁰² Estimates of the size of the Buddhist population and the number of members of other religions – the largest being Taoism – come directly from the 2007 study.

Folk Religions

The 2007 Spiritual Life Study of Chinese Residents offered respondents the opportunity to choose the five religions officially recognized by the Chinese government – Buddhism, Catholicism, Taoism, Islam and Protestantism – but did not offer folk religions as a religious category.¹⁰³ Therefore, the estimate of the folk religion population needed to be computed by considering the beliefs and practices reported by the survey participants. This study’s estimate of the share of the Chinese population affiliated with folk religions (22%) is based on conservative criteria that focused primarily on worshipping or believing in gods or spirits associated with Chinese folk religions.¹⁰⁴ If a broader range of beliefs and practices, such as feng shui practices, were included in the criteria, the estimate would be higher. Other estimates range from 30% by the World Religion Database to 55% by scholars Fenggang Yang and Anning Hu.¹⁰⁵

Religiously Unaffiliated

The unaffiliated are all who do not identify with one of the other religions.

102 The 2007 Spiritual Life Study of Chinese Residents (data archived at the Association of Religion Data Archives, <http://www.thearda.com/Archive/Files/Descriptions/SPRTCHNA.asp>) was a multistage random survey of mainland China administered in three municipalities (Beijing, Shanghai and Chongqing), six provincial capitals (Guangzhou, Nanjing, Wuhan, Hefei, Xi’an and Chengdu), 11 regional cities, 16 small towns and 20 administrative villages. No major cities in the west, the far northeast or on the south-central coast were surveyed. The study was conducted with face-to-face interviews of 7,021 Chinese adults ages 16 and older.

103 Scholars inside and outside of China clearly recognize Chinese folk religion as an important category. For instance, the authors of the “Blue Book of Religions,” a publication of the Chinese Academy of Social Sciences, argue that folk beliefs constitute a part of Chinese religious culture that should be held in the same regard as the five officially recognized religions – Buddhism, Catholicism, Taoism, Islam and Protestantism. See Chinese Academy of Social Sciences. 2010. “Blue Book on Religions.” Chinese Academy of Social Sciences, pages 170-171 and 175. The Chinese Academy of Social Sciences, the highest academic research organization in the fields of philosophy and social sciences, is directly under the State Council of the People’s Republic of China – the highest executive organ of state power as well as the highest organ of state administration. For a more complete discussion of Chinese folk religions, see Yang, Fenggang and Anning Hu. September 2012. “Mapping Chinese Folk Religion in Mainland China and Taiwan.” *Journal for the Scientific Study of Religion*, pages 505-521. See also Wong, Wai Yip. 2011. “Defining Chinese Folk Religion: A Methodological Interpretation.” *Asian Philosophy*, volume 21;. See also Li, Y. Y. 1998. “Zong Jiao Yu Shen Hua Lun Ji [A Treatise on Religion and Myth].” New Century Publishing. See also Feng, Z. Z. and Li, F. H. 1994. “History of Chinese Folk Religion.” Wenchin.

104 Respondents from the 2007 Spiritual Life Study of Chinese Residents survey were classified as adherents of folk religions if they did not identify with one of the other religious groups and they did report that they worshipped gods or spirits at conventional religious sites, at home or in the workplace; or if they attended formal temple services or prayed or burned incense in temples; or if they believed in the existence of gods or spirits, evil forces or demons, heaven, hell, the afterlife or reincarnation.

105 See Yang, Fenggang and Anning Hu. September 2012. “Mapping Chinese Folk Religion in Mainland China and Taiwan.” *Journal for the Scientific Study of Religion*, pages 505-521.

Differences Between Current Estimates and Previous Pew Research Center Estimates

Estimates of the religious composition of a few countries have changed since the Pew Research Center published its 2012 report on the size and distribution of the world's major religious groups as of 2010, "[The Global Religious Landscape](#)." Researchers obtained new or updated data for the following countries: Bangladesh, Finland, Kosovo, Mali, Mauritius, Portugal, Serbia, Switzerland and the United Kingdom. In addition, this report reflects the dissolution of the Netherlands Antilles into Curaçao, Sint Maarten and the Caribbean Netherlands.

The Pew Research Center's 2011 report "[The Future of the Global Muslim Population](#)" found that India had the third-largest Muslim population, after Indonesia and Pakistan. However, this report finds that India has the second-largest Muslim population. The 2011 report used country population estimates from the 2008 revision of the United Nations' World Population Prospects, which estimated Pakistan's total 2010 population to be 184.8 million. This report relies on the 2010 revision of World Population Prospects data, in which Pakistan's total 2010 population is estimated to be 173.6 million. In addition to lowering its estimate for Pakistan, the U.N. Population Division also raised its estimate of India's total population between the 2008 and 2010 World Population Prospects. Meanwhile, the current round of Pakistan's population census has experienced many delays. Preliminary population estimates from Pakistan's 2011 housing census suggest the population could be substantially greater than estimated in the 2010 World Population Prospects data (197.4 million, according to a [report in the Times of India](#)). But the reliability of the preliminary estimates has been publicly contested.¹⁰⁶

In the Pew Research Center's 2011 report "[Global Christianity](#)," the region with the largest Christian population was the Americas. However, as described in the region note below, this report divides the Americas into two regions (North America and the Latin America-Caribbean region). While the combined regions would still have the largest Christian population in the world, among the six regions used in this report, Europe becomes the region with the largest Christian population.

¹⁰⁶ See Rana, Shahbaz. Jan. 11, 2012. "2011 Housing Census results: Over-counting in Sindh, undercounting in Punjab." The Express Tribune. <http://tribune.com.pk/story/319617/2011-housing-census-results-over-counting-in-sindh-undercounting-in-punjab/>.

A Note on Regions

This report groups 234 countries and territories into six major regions: Asia and the Pacific, Europe, Latin America and the Caribbean, the Middle East and North Africa, North America and sub-Saharan Africa. (Some previous Pew Research Center reports grouped the world into five regions; North America and the Latin America-Caribbean region were grouped together as the Americas.)

The 60 countries and territories in the Asia and the Pacific region are: Afghanistan, American Samoa, Armenia, Australia, Azerbaijan, Bangladesh, Bhutan, Brunei, Burma (Myanmar), Cambodia, China, Cook Islands, Cyprus, Federated States of Micronesia, Fiji, French Polynesia, Guam, Hong Kong, India, Indonesia, Iran, Japan, Kazakhstan, Kiribati, Kyrgyzstan, Laos, Macau, Malaysia, Maldives, Marshall Islands, Mongolia, Nauru, Nepal, New Caledonia, New Zealand, Niue, North Korea, Northern Mariana Islands, Pakistan, Palau, Papua New Guinea, the Philippines, Samoa, Singapore, Solomon Islands, South Korea, Sri Lanka, Taiwan, Tajikistan, Thailand, Timor-Leste, Tokelau, Tonga, Turkey, Turkmenistan, Tuvalu, Uzbekistan, Vanuatu, Vietnam and Wallis and Futuna.

The 50 countries and territories in Europe are: Albania, Andorra, Austria, Belarus, Belgium, Bosnia-Herzegovina, Bulgaria, Channel Islands, Croatia, Czech Republic, Denmark, Estonia, Faeroe Islands, Finland, France, Georgia, Germany, Gibraltar, Greece, Hungary, Iceland, Ireland, Isle of Man, Italy, Kosovo, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Monaco, Montenegro, Netherlands, Norway, Poland, Portugal, Republic of Macedonia, Romania, Russia, San Marino, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine, United Kingdom and Vatican City.

The 48 countries and territories in Latin America and the Caribbean are: Anguilla, Antigua and Barbuda, Argentina, Aruba, Bahamas, Barbados, Belize, Bolivia, Brazil, British Virgin Islands, Caribbean Netherlands, Cayman Islands, Chile, Colombia, Costa Rica, Curacao, Cuba, Dominica, Dominican Republic, Ecuador, El Salvador, Falkland Islands (Malvinas), French Guiana, Grenada, Guadeloupe, Guatemala, Guyana, Haiti, Honduras, Jamaica, Martinique, Mexico, Montserrat, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Sint Maarten, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Turks and Caicos Islands, U.S. Virgin Islands, Uruguay and Venezuela.

The 20 countries and territories of the Middle East and North Africa are: Algeria, Bahrain, Egypt, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, the Palestinian territories, Qatar, Saudi Arabia, Sudan, Syria, Tunisia, United Arab Emirates, Western Sahara and Yemen.

The five countries and territories of North America are: Bermuda, Canada, Greenland, St. Pierre and Miquelon and the United States.

The 51 countries and territories of sub-Saharan Africa are: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of the Congo, Djibouti, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mayotte, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Reunion, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, St. Helena, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

A Note on Country and Territory Designation

The word “country” in this report includes countries recognized as such by the United Nations. The word “territory” in this report does not have a technical definition, but rather is a general term for distinct geographical entities not recognized as countries by the United Nations but that have separate population estimates reported by the U.N. Territories in this report include such entities as Hong Kong and Macau (special administrative regions of China), Greenland (an autonomous constituent country within the Kingdom of Denmark) and the Commonwealth of Puerto Rico (an unincorporated territory of the United States).

A Note on Rounding

In this report, estimates of 9,999 persons or fewer are identified as “<10,000.” All other count estimates in tables are rounded to the nearest 10,000. In the narrative of the report, many estimates are rounded to the nearest million or percentage point.

Country and Territory Projection Categories

Formal projections were made for 198 countries. In the main scenario, data on religious switching were available for 70 countries. In an additional scenario, described in Chapter 1 of this report, switching data from similar countries were used as a proxy to estimate switching in an additional 85 countries. For example, in this scenario, switching rates from the United States were used to estimate switching patterns in Canada. In 43 countries, religious switching was not estimated in any projection scenario. Formal projections were not carried out for 36 countries and territories, though estimates from these countries are included in regional and global totals throughout this report.

Countries With Religious Switching Data

The 70 countries and territories with available switching data are: Albania, Australia, Austria, Bangladesh, Belgium, Bosnia-Herzegovina, Botswana, Brazil, Cameroon, Chad, Chile, Croatia, Czech Republic, Denmark, Dominican Republic, Egypt, Ethiopia, Finland, France, Germany, Ghana, Hungary, Indonesia, Iraq, Ireland, Italy, Japan, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Lebanon, Liberia, Malaysia, Mali, Mexico, Morocco, Mozambique, Netherlands, New Zealand, Niger, Nigeria, Norway, Pakistan, Palestinian territories, Poland, Portugal, Russia, Rwanda, Senegal, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Tajikistan, Tanzania, Tunisia, Uganda, Ukraine, United Kingdom, United States, Uruguay, Venezuela and Zambia.

Countries in Extra Switching Scenario

The 85 countries and territories in the extra switching scenario are: Angola, Argentina, Aruba, Bahamas, Barbados, Belarus, Belize, Benin, Bolivia, Bulgaria, Burkina Faso, Canada, Central African Republic, Channel Islands, Colombia, Costa Rica, Cuba, Ecuador, El Salvador, Equatorial Guinea, Eritrea, Federated States of Micronesia, Fiji, French Guiana, French Polynesia, Gabon, Gambia, Greece, Grenada, Guadeloupe, Guam, Guatemala, Guinea, Haiti, Honduras, Hong Kong, Iceland, Iran, Ivory Coast, Jamaica, Kuwait, Lesotho, Libya, Lithuania, Luxembourg, Macau, Madagascar, Malawi, Maldives, Malta, Martinique, Mauritania, Moldova, Montenegro, New Caledonia, Nicaragua, Oman, Panama, Paraguay, Peru, Puerto Rico, Qatar, Republic of Macedonia, Republic of the Congo, Reunion, Romania, Samoa, Saudi Arabia, Sierra Leone, Singapore, Solomon Islands, South Sudan, St. Lucia, St. Vincent and the Grenadines, Sudan, Syria, Togo, Tonga, Turkmenistan, U.S. Virgin Islands, United Arab Emirates, Vanuatu, Western Sahara, Yemen and Zimbabwe.

Countries With No Switching Modeled

The 43 countries and territories that were projected but lack switching data are: Afghanistan, Algeria, Armenia, Azerbaijan, Bahrain, Bhutan, Brunei, Burma (Myanmar), Burundi, Cambodia, Cape Verde, China, Comoros, Cyprus, Democratic Republic of the Congo, Djibouti, Estonia, Georgia, Guinea-Bissau, Guyana, India, Israel, Kosovo, Laos, Mauritius, Mayotte, Mongolia, Namibia, Nepal, North Korea, Papua New Guinea, Philippines, Sao Tome and Principe, Serbia, Somalia, Suriname, Swaziland, Thailand, Timor-Leste, Trinidad and Tobago, Turkey, Uzbekistan and Vietnam.

Countries Not Formally Projected

The 36 countries and territories that were not formally projected due to their small population size and lack of sufficient input data are: American Samoa, Andorra, Anguilla, Antigua

and Barbuda, Bermuda, British Virgin Islands, Caribbean Netherlands, Cayman Islands, Cook Islands, Curacao, Dominica, Faeroe Islands, Falkland Islands (Malvinas), Gibraltar, Greenland, Isle of Man, Kiribati, Liechtenstein, Marshall Islands, Monaco, Montserrat, Nauru, Niue, Northern Mariana Islands, Palau, San Marino, Seychelles, Sint Maarten, St. Helena, St. Kitts and Nevis, St. Pierre and Miquelon, Tokelau and Turks and Caicos Islands.