The Stagnated Global Convergence on the Awareness of Emergency Contraception: A Multi-Country Analysis

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Author: Olivier Sulzer
EMLE student number: 17402
olivier.sulzer@emle.eu
Supervisor: Professor S. Chandrasekhar
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1. Introduction

This paper contains a multi-country analysis on the awareness of emergency contraception[1] (EC) in developing countries for men and women based on Demographic and Health Surveys (DHS) data. All relevant and available standard DHS datasets were merged to allow not only for a cross-country analysis but also for an analysis over time. For the analysis on awareness of EC, 131 survey datasets were pooled for women (64 countries) and 101 survey datasets were pooled for men (55 countries). This research builds on the work of Palermo et al (2014) who were the only ones to perform an empirical analysis on the awareness of EC until now. The timeframe of the analysis in this paper ranges from 1999, when information on EC was included in the individual questionnaires, to 2017 which is the year of the most recent survey.

During this timeframe, EC has been a hotly debated topic in many countries. The advocates of EC are the pharmaceutical companies producing them, women's reproductive rights activists, scientists and healthcare providers. They contend that making EC largely available will lead to more conscientious procreation, a reduced amount of unwanted pregnancies, lower healthcare costs and further emancipation of women. The opponents of EC usually have political, cultural or religious motivations and claim that allowing EC on the market would lead to debauchery, a rise in sexually transmitted diseases, the murdering of embryo's, a ceasing in the use of regular contraceptive methods and moral degeneracy (Prescott, 2011; Foster and Wynn, 2012). In the Philippines EC got approved in 2000 by the Department of Health to make it available for victims of sexual assault. This lead to the opposition of anti-abortion groups who pressured the government into delisting EC again in 2001 and up until today EC is still not available in the Philippines (Torrevillas, 2002). Registration of EC throughout Latin-America led to various lawsuits against governmental bodies in Chile, Peru, Colombia, Mexico, Ecuador, Argentina and Brazil mainly because representatives of the Vatican hold that EC methods are abortifacients and thus equal to murder. In 1997, the government of Chile was forced to remove EC from the national guidelines leading to unavailability of EC for child and adolescent rape victims. The government finally included it again in 2004 after which municipal officials started to block the public provision of EC. Meanwhile, the Supreme Court of Chile had forbidden the distribution, sale and manufacturing of EC through the private sector in 2001 (Foster and Wynn, 2012). Similar events occurred all over the world and there are currently 47 countries that still did not register any method of EC of which 30% lay on the African continent.[2] Additionally, EC is still excluded from numerous national family planning programs and many countries still do not provide EC through the public sector which means that it is not even available through post-rape care (Status of analyzed countries: Table 1). But resistance towards EC also occurred on lower levels. Walmart initially refused to sell EC in the USA. They finally shifted their ground and started to supply their 4000 pharmacies in 2006 after losing a lawsuit in the State of Massachusetts (Thottam, 2006; Pace, 2006). Furthermore, hospitals often conceal the option of EC and

[1] EC is a form of modern contraception. It provides women with reproductive rights by allowing them to limit their number of children and to space births of children post-coital. Modern contraceptives distinguish themselves from traditional methods (withdrawal, periodic abstinence and lactational amenorrhea method) by being technologically designed to overcome biology. There are two forms of EC. The first one is emergency contraceptive pills (ECPs) also known as the morning after pill. The second one is intrauterine devices (IUDs), but they are mostly used as primary contraceptive (Hatcher and Nelson, 2007). Since the latter is laborious and therefore barely used as EC, it is not taken into account in this research.

[2] Registration status obtained through status and availability database from the International Consortium for Emergency Contraception (ICEC). African countries without registration of EC: Angola, Burundi, Cape Verde, Comoros, Equatorial Guinea, Eritrea, Gambia, Guinea-Bissau, Libya, Sao Tome and Principe, Somalia, South Sudan, Sudan, Western Sahara.

don't provide information on EC (Boonstra, 2003). In December 2012, a rape victim was even refused treatment at two Catholic hospitals in Cologne, because they were reluctant to counsel her on EC (Spiegel online, 2013).
The debate around EC was nowhere more ardent than in the United States of America and EC was long called the nation's best-kept secret here, because of its sporadic use (Hatcher et al, 1995; Coeytaux and Pillsbury, 2001). Luckily, after a 40 years lasting crusade against the prohibition of EC, the proponents of EC in the USA gained territory and were eventually able to play first fiddle with the first registration of EC in 1998 and after several other victories, finally got EC available without age restriction or prescription in 2013. In 2002 only 4.2% of sexually experienced women between 15-44 had ever used EC in the USA, but between 2006 and 2010 this was already 11% (Daniels et al, 2013). In France, this share was 17% between 1999 and 2004 (Moreau et al, 2006). Although the knowledge of EC and the access to it is still far from desirable in most developed countries, it is on the rise. But what about the developing countries? In our present-day society, there are already 147 countries with at least one registered EC product and 26 countries without registration, who import at least one EC product. This leaves only 21 countries where the access to EC seems hindered (Figure 1).[3] Despite this, it has become clear that the hard-fought registration and provision of EC in developing countries has not led to a global convergence of awareness on EC. Governments, NGO's and international agencies clearly failed to bridge this gap. In Azerbaijan, only 4.6% of women between 15 and 49 have ever even heard about EC let alone used it. Similar results can be found in Chad (5.7%) and Niger (4.4%).[4] The results show that in total only 19.7% of women between 15 and 49 have ever heard about EC in the developing world and just 1.7% of them has ever used EC in their life. Family Health International, the International Consortium for Emergency Contraception (ICEC) and several other sources claim that awareness is nevertheless increasing in developing countries based on DHS survey data (ICEC, 2017; Parker, 2005; Foster and Wynn, 2012).
The analysis in this paper shows that both men's and women's awareness of EC has stagnated or have even decreased for many developing countries when the year of the interview and some simple individual and household characteristics are taken into account (age, education, place of residence, marital status, current use of modern contraception, unmet need for contraception, heard of family planning in past months and ever had sex). From the 41 countries analyzed over time, a whopping 22 had experienced at least one decline in women's awareness of EC over time and for men's awareness this was 11 out of 26. The finding that awareness of EC is stagnating or even decreasing in developing countries is worrying. Although emergency contraception (EC) is filling a niche market, its worldwide accessibility is of the utmost importance. The need for EC is especially sizeable in developing countries since they generally have a higher unmet need for contraception, more unsafe abortions, higher rape rates, more crisis situations and more maternal and infant deaths (Guttmacher Institute 2017; WHO 2018; Harrendorf 2010; Alcantara-Ayala 2002). It should also be considered that in general poor people are unable to pay for EC supplied through the commercial sector.
The models further show that the odds of having heard of EC for both men and women increase incrementally with education and age (up to age group 30-34), being never-married, heard of family planning in past months, urban households and for men currently using modern contraception. Living together and an unmet need for contraception (women only) on the other hand have a negative influence on the awareness. There are also clear regional and religious patterns when comparing the

[3] Registration status obtained through status and availability database from ICEC.
[4] Based on most recent DHS survey data: Azerbaijan (2006), Chad (2014/2015) and Niger (2012).

awareness of EC which will be elaborated in the results section. For the implementation of efficient targeted policies on EC, it is essential to identify specific household, individual, regional or country level characteristics causing the low awareness rates on EC.

Section 2 will briefly elaborate on emergency contraception and will lay out the groundworks on EC that are needed for this research. Section 3 entails nuances on the influence of EC regulation and will provide a global assessment of regulation on EC so far. Section 4 contains information on the data used and provides some summary statistics. Section 5 explains the methodology of the empirical analysis and encompasses the results. Finally, Section 6 quickly recapitulates the findings after which the policy implications will be derived and the avenues for further research will be discussed. The Appendix on the usage of EC contains an additional analysis of women who have ever used EC.

2. Background on emergency contraception

EC is a distinctive part of the birth control mix which serves a much-needed niche, since this is the only birth control method that can prevent a pregnancy post-coital. Producers and the World Health Organization (WHO) state that EC pills will prevent up to 95% of all pregnancies when taken within up to 5 days after sexual intercourse (Von Hertzen et al, 2002). The EC currently sold in the market is perfectly safe, has limited side effects and does not disturb an already established pregnancy (Zhang et al 2009, De Santis et al, 2005). EC pills can be employed in case of infrequent sex, concern for contraceptive failure, incorrect use of any method or when no contraceptive method was used. Failure of birth control methods is clearly a worldwide phenomenon, think of broken condoms for example. The same holds for situations in which no method is used at all just as for the erroneously use of birth control, like forgetting to take the pill. One-quarter of all women with an unmet need for contraception in developing countries declared that they don't use birth control because of infrequent sexual intercourse (ICEC, 2017). Therefore, EC can be a useful lifeline for these women. In addition, there are also certain circumstances in which EC is particularly of importance. Firstly, there are crisis situations such as armed conflicts or natural disasters in which EC becomes a necessity. During a crisis, people often must abandon their homes and the supply of contraceptives can be obstructed. In these situations, Prostitution and transactional sex usually become commonplace just like sexual violence. On top of that, a crisis is evidently a horrible timing for an unwanted pregnancy and goes hand in hand with infant deaths, maternal deaths and unsafe abortions. Secondly, EC should be an indispensable part of post-rape care. Considering the alarming rape statistics compiled by the United Nations Office on Drugs and Crime (UNOD), emergency contraception can be a true salvation for many women and these are just the reported cases (Harrendorf et al, 2010). It is estimated that among rape victims of reproductive age the pregnancy rate after rape is around 5% in the US (Holmes et al, 1996; Thornhill and Palmer, 2001), 17% in Ethiopia (Mulugeta et al, 1998) and 15-18% in Mexico (Krug et al, 2002).[5] Lastly, young women have a special need for EC, because they are regular victims of sexual assault, frequently don't use contraception, have less knowledge on birth control, are regularly judged by EC providers and are sometimes bound by age restrictions (Westley et al, 2013).

[5] Off course the individual chances are highly dependent on the victim's menstruation cycle.

In 1996, 7 organizations founded the International Consortium of Emergency Contraception (ICEC) with the mission to increase the accessibility of EC and to establish its safe use around the world with a special focus on developing countries. They developed a 9-step framework for introducing EC into national programs, preferably within a family planning program offering various contraceptive methods (ICEC, 2003). The priority of the ICEC was to expand access to EC for victims of rape and this also turned out to be a very strategic way to generate further support for the implementation of EC in international and national norms. EC was however still difficult to obtain for women in most countries, because of its prescription-only status. Therefore, advocates of EC mobilized themselves to make EC available without having to go through a doctor which triggered a great deal of resistance based on cultural, religious or political grounds. One of the main arguments of the advocates of EC was that it would reduce the number of unintended pregnancies and abortions. Surprisingly, increased access to EC did not seem to lead to decreased rates of unwanted pregnancies or abortions (Glasier, 2004; Raymond et al, 2007; Polis et al 2007). This became a huge pitfall for EC proponents, they had to remodel their entire strategy since their main argument had been completely dismantled. They started to emphasize more on the women's autonomy, human rights and justice aspects (Foster and Wynn, 2012).

Lastly, it is essential to grasp the mechanism of action of EC to develop comprehension for both sides in the heated debate. Researchers long believed that EC works through three different channels: Preventing or delaying the ovulation, preventing sperm cells to reach the ovum or preventing implantation of a fertilized ovum. The last mechanism mentioned is the most contentious one, because even though the medical world defines the implantation as the beginning of a pregnancy, some religious interpretations define the fertilization as the origin of human existence (Wynn and Trussell, 2006). This means that from their perspective, EC would be equal to abortion if it indeed has a post-fertilization effect. For a long time, there was no technique to test if this was the case and how EC worked remained a black box.

In 2005 researchers were finally able to prove that levonorgestrel pills[6] do not harm a developing fetus if mistakenly taken, do not interfere with an established pregnancy or harm a developing embryo (Zhang et al 2009, De Santis et al, 2005; Speroff and Darney, 2011; Jensen and Mishell, 2012). Based on these studies, most researchers now postulate that progestin-only EC will block or delay the ovulation, but that it does not prevent the implantation of a fertilized ovum in the uterine wall (WHO, 2010). This signifies that even from the Catholic view of the beginning of a gestation, EC is not capable of terminating a pregnancy already in progress. EC thus merely blocks or delays the ovulation which prevents the male sperm from fertilizing the ovum, because it only has a maximum lifespan of around 5 days. In March 2011, the International Federation of Gynecology and Obstetrics (FIGO) finally issued a statement saying that levonorgestrel ECP cannot prevent the implantation of a fertilized egg and that this information should be removed from all product labeling (Bellock, 2012). The FDA also acknowledged that EC pills did not inhibit implantation, but nevertheless did not remove this unsupported claim from the packaging label. In 2013, the European Medicines Agency approved an alteration to the label of NorLevo stating that it will not prevent the implantation of fertilized eggs (European Medicines Agency, 2014; Bellock, 2013).

[6] Type of EC (progestin-only).

3. Regulation on emergency contraception

3.1 Understanding the influence of regulation on emergency contraception

The government of the Philippines withdrew the approval for the only EC that was available on the market in 2001. Still, the Philippines have higher usage rates of EC then neighboring country Indonesia which was one of the pilot countries where EC got introduced by ICEC (Palermo et al, 2014; ICEC, 2006b). This implies that EC is widely available on the black market in the Philippines. This is only one of the many examples showing the divergence that can arise between de jure regulation and its de facto effects. Apparently, it is not just regulation, but primarily the judgment of a society which is pivotal for contriving access to EC. In this section, this phenomenon will be discussed in light of the effectiveness and issues around the implementation of EC regulation worldwide.

3.2 The emergence of laws and the role of norms

Ulmann-Margalit tried to explain the emergence of norms based on social interactions (2015). She provides the example of the Ashkenazi Jewry, where at some point in history a norm emerged that forbid the opening of a letter without the permission of its author. One historical explanation for this could be the that European Jews managed their commerce through the correspondence of letters carried by envoys. In the 11th century, the number of letters that were intercepted increased and with it the leakage of their confidential contents. This eventually encouraged Rabbi Gershom (960-1028) to implement a ban on the unauthorized opening of letters, enforced by a harsh punishment of excommunication. One could also see this as a demand explanation since the demand for such a norm increased among the Jews active in commerce. Another reason for the origin of this norm however, could be that it was the confidential correspondence between rabbi's that was leaking during the 12th century, exposing delicate information on matters like divorce and marriage. This variant could also be interpreted as an interest group explanation since the group that has political power designs the norms according to their own needs. Holding this thought, it might even possible to discover why some religions or societies are so hostile against certain technological developments, such as EC. Nevertheless, this is a bridge too far for this research. What we can do though, is draw a parallel between the emergence of norms and the emergence of laws. Ulmann-Margalit did not find much distinction between norms and rules, besides the fact that rules are codified and norms are not. Based on the example of the Ashkenazi, we can conclude that laws do not always come into existence as a response to demand for them and that laws won't always change when society wants them to change. Box 1 provides an example that shows how this theory could be relevant for regulation on EC.

Box 1: How the emergence of laws can matter for EC regulation: The case of Iran.

In 1967, Iran introduced its first National Family Planning program. The Family Protection Law was passed by the Iranian parliament to reduce the excessive population growth rates and to increase the standard of living for Iranians. For a decade, the fertility rates dropped and after the Iranian revolution in 1979 Ayatollah Khomeini even approved certain family planning methods. Contraception was freely available for all Iranians. Nevertheless, the National Family Planning program got suspended in 1980 and the Iranian government suddenly became pro-natalist. The legal age for marriage was reduced to 9 years for boys and 12 years for girls. Furthermore, the government created additional economic incentives for having more children, family planning clinics disappeared and the supply of contraceptives became restricted. The underlying reason for this radical change in policy appeared to be the Iran-Iraq war. The Iranian government revised its opinion and started to see their huge population as a military advantage in lieu of a constraint for economic development. The Iranian fertility rates started booming again in the 80's until the Iranian leaders finally realized that their policy would have devastating socioeconomic effects in the long run. In December 1989, a new Family Planning Program was adopted and Family Planning clinics emerged and contraceptives became widely accessible again. Young couples were even obliged to follow a contraceptive course and awareness on contraception increased exponentially through the media and schools. The program was very effective and the total fertility rate dropped from 6.8 in 1984 to 2.17 in 2000. However, this was not just the result of the policy. The Iranian government acknowledged that for laws to be sustainable, they should be in alignment with the norms of their religion. Therefore, they induced some influential religious figures to back them up and in their promotional campaign, they put the main emphasis on the Islamic support. This lasted until 2012 when the government of President Mahmoud Ahmadinejad decided to take another U-turn in the family planning policy. They stopped Iran's entire family planning program again with the help of the Islam (Abbasi-Shavazi, 2000; Mishal and Goldberg, 2014).

Although the mechanisms of social norms and laws seem similar, it is important to distinguish them (Ellickson, 1998). There are two schools of thought both offering less than satisfactory theories on the role of norms in society. Firstly, the legal centralism theory of the classical Law and Economics approach heavily under-appreciates the role of non-legal systems and overrates the role of law in achieving social order. They believe governments have a monopoly on lawmaking and are therefore the main sources of rules and enforcement. This theory completely neglects the role of norms in society and carries the implicit assumption that actors know and abide by the law. Critique on the legal centralism theory is that people are often unaware of the law and depend on norms when resolving disputes, self-help enforcement is pervasiveness and that use of attorneys for non-business problems is only sporadic. Secondly, there is the Law and Society theory. Its partisans have long been aware of the importance of norms in coordinating human interactions. Nonetheless, their visions are so broad-ranging that they failed to come up with a basic theoretical framework around norms. In the absence of such a theory, researchers are forced to take norms as exogenous rather than as an explanandum which needs to be explained. Ellickson believes the classical Law and Economics approach is a desert where the Law and Society approach is a swamp. Evidently, both should be put under scrutiny, but what we can deduce for now is that norms undoubtedly matter and that they play a key role in coordinating human interaction.

When EC is required, time is of the essence. However, in many countries there is still no EC drug registered, a prescription is still required, there are age restrictions or there is no public provision of EC. All these hurdles increase the costs of obtaining EC. In developing countries, a high price of EC also blocks access to it where in developed countries, health insurance coverage can potentially increase access to EC. Governments can try to get rid of these impediments to EC, but norms will always be critical for the effectiveness of regulation. Latin-America is the perfect example of this. The registration of EC led to a lot of opposition here and lawsuits emerged against governmental bodies in Chile, Peru, Colombia, Mexico, Ecuador, Argentina and Brazil. Their claim was that EC was unconstitutional, because it violates the protection of human life which starts at fertilization (Schiappacasse, 2006). In Chile, the first EC product got approved in 2001 and in 2009 there were 5 EC products registered. The growing conservative resistance, however, blocked these products from becoming widely available and some of these products never even made it to the pharmacies. In 1997, The Ministry of Health attempted to include EC into national guidelines to make EC available through the public sector for child and adolescent rape victims. However, conservative groups forced them to remove this part from the guidelines. In 2004, they finally succeeded to include EC into the Chilean guidelines on victims of sexual violence. This however led to several public statements of municipal officials prohibiting the public provision of EC in their municipalities. In the private sector EC also failed, since the Supreme Court of Chile banned the distribution, sale and manufacturing of the first registered product Postinal in 2001.[7] In 2005, the Supreme Court finally ruled in favor of EC and allowed its distribution. As a response, opponents stepped to the Constitution Tribunal which ruled in favor of the plaintiffs in 2008 and again forbid all EC provision through the public sector the only exception being rape victims. Despite the inclusion of EC in fertility regulation in 2010, its availability in the public sector is still limited (Foster and Wynn, 2012). This clearly shows that governments will never succeed in making EC widely accessible if the prevailing norms within their countries do not approve of it.

3.4 The importance of society and the interconnectedness of law

This is also the opinion of Tamanaha (2011). He states that society is the kingpin for legal development and he agrees with the position that culture matters for legal efficiency (Harrison et al, 2000; Landes, 2000). This is the reason for the non-transferability of law which states that the same law will only coordinate human behavior in a similar way by fortuity when the political, social and economic climates in both places are different (Seidman, 1978). Tamanaha however believes that there is not just a causal relationship from culture towards legal rules, but that culture and legal institutions are mutually constitutive. This means that legal rules require respect as well as support from the populace and to secure this, legal rules must serve the needs of the populace. According to him, both factors in this relation can't exist without the other and he solves this chicken and egg dilemma by concluding that both came about simultaneously. He came up with the connectedness of law, meaning that every aspect of society matters for the way in which legal rules work and how they are received. This encompasses among others tradition, history, culture, the political and economic system, the distribution of wealth and power, the level of industrialization, ethnicity, religion, education, degree of urbanization, geographical position and international relations. Law itself will never be able to succeed or have foreseeable outcomes,

[7] Philippi Izquierdo and others v. Ministry of Health and others, August 20, 2001.

because it swims in the social sea with all other factors of society. This idea corresponds nicely with the theory around law in the books versus law in action.
Now let's apply this insights to the regulation on EC. Imagine that registration of EC gets approved in a country that is strictly religious with low wealth, education and urbanization. Would the registration of EC increase the knowledge and use of the product? How would society judge if someone would decide to buy EC? And how would the conservative pharmacist respond if someone would ask for EC? Now imagine that The Netherlands, an extremely liberal country where the use of EC has been allowed for years, suddenly would prohibit its use. Would this change anything on the knowledge and use on EC? Even on the long term, the population will most likely find ways to keep EC widely available just as they do now with all sorts of soft and hard drugs that became prohibited under their Opium law in recent years (European Monitoring Centre for Drugs and Drug Addiction, 2017).
Because of the initial black box around the precise functioning of EC, the limited public knowledge on EC and the lack of qualitative research, discussions on EC eventually separated worldwide with each country demarcating its own bugbears influenced by the aspects of their society. In Latin America and other countries dominated by Catholicism the contentious point is without a doubt the professed post-fertilization effect of EC discussed in the previous section. Representatives of the Vatican still hold that EC methods are abortifacients and thus equal to murder and pro-life groups started lawsuits against regulatory agencies for approving emergency contraception all over the world (Schiappacasse and Diaz, 2006). They believe that pregnancy begins with fertilization and not with implantation of the blastocyst in the wall of the uterus. Their claim is that using an EC pill therefore might terminate a pregnancy already in progress and thus falls within 'the sin of abortion' (The Vatican, 2000; Schiappacasse and Diaz, 2006; Purdy, 2007). Regrettably, the Catholic church still refuses to accept the most recent discoveries around the working of EC pills, preserving their establishment on the backs of over a billion believers.
In Muslim societies however, this is not an issue at all since they have very disparate opinions on the starting point of human existence. They believe that the fetus becomes a living human being only after 4 months of pregnancy.[8] Therefore the debates in Muslim countries are much more concerning the moral effect that EC would have on unmarried women. A big exception here is Tunisia, where EC has been implemented without a fight (Foster et al, 2014). This proves that it is not just religion, but also social, political and cultural factors that influence the public opinion on medical innovations such as EC. Besides these, the power of activists and lobby groups, the design of the healthcare system and the status of pharmacists are also crucial elements influencing the local disputes. Other reasons for conservative attitudes towards EC are general misconceptions about EC due to poor sexual education (Aziken et al, 2003; Tripathi et al, 2003; Babaee and Jamali, 2003; Romo and Berenson, 2004) and the lack of recognizing women's reproductive rights (Diaz et al, 2003).
Interestingly, all these local interpretations on new technologies also shape the fields of new research within a society. Where in Latin America research exploded on the question whether EC was a post fertilization method (Croxatto et al, 2003; Muller et al, 2003), the activists in the US tried to prove that EC would not lead to an increase in HIV and STD rates which was one of the main arguments of their counterpart (Gold et al, 2004; Rain et al, 2005; Raymond et al, 2006). Thus, to fully grasp the EC debates around the globe, we must keep in mind how religion, culture, politics, activism and

[8] Sahih al-Bukhari, 4:54:430.

research are interconnected along the evolution of EC through time and how this affects the access to EC.
Another impediment for access to EC is the poorly informed service providers and pharmacists. Especially in developing countries, they often have no idea about how EC precisely works and how it should be used. On top of that they are frequently influenced by opponents of EC. This is the reason that they will often judge their customers when buying them, expressing their moral objections or even refusing to sell EC to them (Fallon, 2003; Lindberg, 2003). In turn, this judgmental behavior is the reason that young women who need EC often feel ashamed and fail to seek help (Fallon, 2013). Even in the USA many pharmacists deliberately neglected to supply their stores (Boonstra, 2003; Bennet et al, 2003). Walmart, one of the biggest drug stores in the country refused to sell EC for years (Langer et al, 1999; Galvão et al, 1999; Cohen, 1994). When Walmart eventually got forced to sell it in Massachusetts and Illinois after losing a lawsuit in 2006, they finally decided to start supplying their 4000 pharmacies (Thottam, 2006; Pace, 2006). Its employees however still tried to discourage certain customers from buying it by intimidating them (Joannides, 2010). Furthermore, hospitals caring for women who had been raped did not even provided EC or any information on this option in many cases (Boonstra, 2003).

3.5 Emergency contraception regulation: A global assessment

There are many regulatory factors influencing the awareness and use of EC and regulation on EC differs largely worldwide. Firstly, women's access to EC is significantly influenced by the availability of EC products in their surroundings. There are several dedicated EC products on the market, which are specifically labeled and packaged for post-coital usage. However, it is extremely difficult for women to obtain these products if there are no EC products registered or imported in their country. If this is the case women cannot get EC at hospitals, health clinics or pharmacies. An alternative solution in that case can be the off-label use of combined regular oral contraceptive pills based on the Yuzpe Regimen.[9] Nevertheless, it is supremely hard to promote EC and increase the usage and awareness rates among women without a dedicated product on the market. A dedicated product provides instructions for use, creates awareness, informs health care providers and makes a public promotion possible. Luckily there currently are already 147 countries that have registered at least one EC product. 26 countries presently have no registered EC product, but import at least one EC product or used to do so and 21 countries have no registered EC product and don't seem to import any either (Status of analyzed countries: Table 1).[10] Could there be a connection between these 21 countries? 4 of them are known for their heavy opposition against EC and their occurrence on this list is thus not surprising (Costa Rica, Philippines, Malta, Honduras). Interestingly, 6 countries have recently been or are currently involved by a conflict (East-Timor, Libya, North-Korea, Somalia, Sudan, and Western-Sahara). Furthermore, seven of the listed countries have populations below one million of which five are even below 500.000 (Brunei, Cape-Verde, Micronesia, Saint Kitts & Nevis, Samoa, Tuvalu and Western-Sahara). It could be that these small countries are not profitable enough to attract commercial providers of EC. The remaining countries on the list are all from the Middle-East (Bahrain, Jordan, Oman, Qatar, and United Arab Emirates) (ICEC, 2014). Importing EC is typically done for the public sector with help from NGO's or the UN. Unfortunately, it is hard to estimate the scale at which import is happening.

[9] Discovered by Albert Yuzpe in 1970's.
[10] Registration status obtained through status and availability database from ICEC.

A second difference across countries concerns the ease at which a registered product is available. This can be prescription-only, behind-the-counter (BTC) or over-the-counter (OTC) as displayed for all analyzed countries with a registered product in Table 1. BTC allows people to obtain EC without seeing a doctor. Unlike OTC however, a BTC drug is not accessible without the involvement of a learned intermediary. These distinctions thus concern the status and role of the pharmacist. It is salient to keep in mind here that entrusting pharmacists with this responsibility also gives them the chance to abuse it.
A third dissimilarity can be found in the age restrictions. These range from no age restriction to over 16 years old only (Status of analyzed countries: Table 1). Furthermore, Germany requires parental consent for children under 14 years old.
A fourth difference is the provision of EC through the public sector. The private commercial sector already supplies EC in practically all countries where it is available. Public provision is nonetheless also essential, since it makes EC available for rape victims in hospitals and it increases public knowledge about EC by harmonizing it with regular contraceptive education. On top of that, it can also lower the price. Unfortunately, the public sector is not involved yet in various countries. Also worthwhile noting is that the lowest level provider allowed to dispense EC in a sector could be an indicator of the ease with which EC is obtainable in a country. Table 1 exhibits which analyzed countries allow for public sector provision of EC together with the lowest level providers and the average price of EC. A last sector that provides EC worldwide consists of the NGO's.[11] They are crucial in promoting and selling EC in developing countries and typically make use of social marketing programs to spread knowledge on EC. This entails creating hotlines, setting up websites and disseminating flyers and posters. Regrettably though, a lot of social marketing programs on family planning do not include EC yet. Table 1 shows in which analyzed countries EC is offered through social marketing. NGO's either partner up with a pharmaceutical company or import and distribute EC themselves. If they cannot get any form of EC registered in a country, they might supply it there themselves anyway. This is something that should be kept in mind when analyzing EC usage rates. Lastly, procurement of EC can also happen through governments or donors (UNFPA[12], USAID[13]) that contract directly with pharmaceuticals.
A fifth distinction between countries is whether they include EC on their National Essential Medicine List (NEML). This is a list with medicines that meet the paramount healthcare needs of a society which it is based on the WHO Model List of Essential Medicines, but adapted to national priorities. The incorporation of EC on this list will mandate the availability in all public health facilities and shows that a country is trying to make EC widely available. Reversely, the occurrence of stock outs at the warehouse of the public sector is an example that could indicate that some public servants are thwarting the proliferation of EC. Table 1 discloses which analyzed countries incorporated EC on their NEML and which countries experienced a stock out of EC in the public sector in 2015.
A last differentiation between countries regulation regarding EC is the insurance cover. If countries have a mandatory basic health insurance then the government could have an influence on the medicines that must be covered under this insurance scheme. In this case, they could obligate health insurance providers to fully reimburse EC, partly reimburse EC, only reimburse EC on prescription or solely reimburse EC below a certain age under the basic insurance package.

[11] Prime examples: DKT International, Marie Stopes International, Population Services International, ProSalud, Interamericana, The International Planned Parenthood Federation.
[12] United Nations Population Fund.
[13] United States Agency for International Development.

3.6 Inference on emergency contraception regulation

Table 1 divulges that there are many differences in the supply and regulation of EC between all developing countries included in the analysis of this paper. Governments, NGO's, donors and international organizations should therefore keep on fighting to increase the access to EC. It has become clear in this section however that even in a democracy regulation is not always a response to demand and that therefore laws do not always change when a society wants them to change. In this case NGO's, International Organization and donors fulfill a crucial role in supplying EC and meeting the demand in these countries. It has also become clear that governments that are trying to make EC widely accessible will have a hard time pushing their regulation through if the prevailing norms in their countries disapprove. And even if EC regulation gets approved in a society, this will not improve the awareness and use of EC if it is not in line with the customs of a society. The opposition of societies towards EC is commonly based on misconceptions and thus informing people and breaking the taboo will be the solution for increasing the access to EC. Creating this change of culture should be pre-eminently a role for governments. They must not just get EC registered, but also ought to actively promote EC, provide it through the public sector and integrate it with their family planning programs.

4. Data and Summary Statistics

4.1 Demographic and Health Surveys

The empirical analysis in this paper is based on data from the Demographic and Health survey (DHS) program. The DHS program is primarily funded by the U.S. Agency for International Development (USAID) and is implemented by ICF International. It gathers and disseminates nationally representative data with the aim of increasing the global understanding of health and population trends in developing countries. For this paper, only the Standard DHS Surveys are used. These are household surveys that provide a large span of data within the areas of population, health and nutrition. They consist of large sample sizes generally ranging between 5000 to 30.000 households and they are commonly taken every 5 years which makes them suited for comparisons over time. All Standard DHS datasets that contain data on either women's or men's awareness are used. This means that the timeframe for the empirical analysis ranges from 1999, when information on EC was included in the individual questionnaires, to 2017 which is the year of the most recent survey. The individual questionnaires are administered to all men and women between 15 and 49 years old. The first variable of interest is thus women's awareness on the existence of EC. Interviewers first asked respondents which contraceptive methods they knew. For all contraceptive methods that were not mentioned, the interviewer asked if they had ever heard about them. The corresponding statement about EC from the survey reads:

> 'As an emergency measure after unprotected sexual intercourse, women can take special pills at any time within three/five days to prevent pregnancy.'

Interviewers referred to EC as either the morning after pill or as local brand names. If respondents concurred with this statement, their answer was coded YES just as for all respondents who mentioned EC as a contraceptive method spontaneously. The rest is coded NO. The same question was asked to men which matches with the second variable of interest, namely men's awareness on the existence of EC. Lastly, it must be

noted that fertility- and sex-related questions are only asked to ever-married women in certain countries (Egypt, Indonesia, Jordan, the Maldives, Pakistan and Turkey).

4.2 Summary Statistics

Palermo et al (2014) were the first to perform an empirical analysis on awareness of EC. They executed an analysis on 45 individual countries based on the most recent DHS standard women's survey data from 2000 up to 2010. They controlled for unobserved regional characteristics, but the DHS data is unfortunately not substantial and widespread enough for a regional fixed-effects modeling approach. This model also does not allow comparisons over time. Therefore, all available DHS standard datasets were pooled together in this research for both variables of interest mentioned above.[14] For the first variable on women's awareness of EC this resulted in a combined dataset containing 131 surveys with data on 64 countries in total. For the second variable on men's awareness of EC, it was possible to merge 101 datasets encompassing data on 55 countries. There are slightly less men's surveys included since the DHS program does not administer these for all countries. Table 3 shows which standard DHS datasets are included in the analysis on both women's and men's awareness. This Table also reveals the percentage of women and men that had ever heard about EC for every survey. Ranking the regions according to women's average awareness puts Asia at the bottom with 16.8%, Northern & Western Africa fourth with 17.3%, Europe & West Asia third with 22.8%, Eastern & Central & South Africa second with 23% and Latin America and the Caribbean at the top with 38,5%. Africa is split up into multiple regions, because most of the surveys are taken from here. One should be cautious in drawing any conclusions based on these regional differences though, since there are sadly not enough surveyed countries to make them representational.

When looking closely at the percentages in Table 3, it seems that awareness has increased substantially over the years. Regrettably, not all countries have undergone multiple surveys which is evidently a necessity for an analysis over time. For all countries that do however, Figure 2-5 graphs the change that women's awareness on EC has undergone over the years. For clarity, the countries here are divided over Western Africa (Figure 2), Eastern Africa, Central Africa and Southern Africa (Figure 3), Latin-America and the Caribbean (Figure 4) and Asia (Figure 5). These Figures clearly display the upward trend in women's awareness all over the world. Peru is the only country that experienced an overall decline. This seems to be due to an outlier in 2012 however, since their awareness did increase for four subsequent years. Figure 2 clearly shows that Ghana is outperforming West Africa by a mile whereas Niger is at the very bottom of the graph and barely improved over the years. From Figure 3 is can be deducted that Kenya is the peak of East/Central/South Africa and that Chad is bringing up the rear. In Figure 4 it is apparent that Colombia and the Dominican Republic have undergone an enormous increase since the millennium which is why they are not only in the lead for Latin America and the Caribbean, but also for all surveyed countries over time combined. From Figure 5 it becomes obvious that India, Nepal and Armenia have undergone a similar growth pattern and score significantly better then Cambodia, Philippines and Timor-Leste.

Table 3 further discloses that male awareness of EC also took a spurt since the turn of the century. Among men, the only overall decline is marginal and occurs in the Dominican Republic from 26% in 1999 to 25.7% in 2002. These optimistic results are

[14] In this process, a few datasets automatically got merged by Stata: Colombia 2000/2004-05, Cambodia 2005-06 /2010-11, Jordan 2007/2009, Malawi 2000/2004-05, Peru 2003-08, Rwanda 2000/2005, Rwanda 2010-11/2014-15 and Senegal 2010-2016.

the reason that Family Health International, the International Consortium for Emergency Contraception (ICEC) and several other sources claim that although awareness on EC is low in developing countries, it is rising (ICEC, 2017; Parker, 2005; Foster and Wynn, 2012). Therefore, these results lay at the foundation of many policies on EC.

Another remarkable observation is that men seem to have way more awareness on the existence of EC then women. Out of all 101 surveys that also included male respondents, men seem to have more awareness in 72 cases where women only have more awareness in 28. In Togo, it was a tie. The differences between percentiles are also often marginal when in favor of women, but in many cases substantial when in favor for men. The average male awareness adds up to 25.6% where the average female awareness is 19.7%. Latin-America and the Caribbean is the only region in which the average awareness is higher for women then for men.

Figure 6 exhibits the percentage of all women who have ever used EC based on the most recent DHS survey data for each country. the staggering low usage rates immediately catches the eye. All countries are divided into four quantiles, because this reveals the relative differences between countries. In 75% of all surveyed countries less then 2,7% of all women have ever used EC, in 50% of all surveyed countries this is less then 1% and in 25% of all surveyed countries this is even less the 0.4%. The average ever usage rate of EC for all surveyed developing countries is only 1.7% (Appendix on the usage of EC, Table 2).

5. Empirical Model: Correlates of Awareness

5.1 Empirical Model

The empirical analysis in this paper is based on multivariate logistic regression models and the explanatory variables are reported as odds ratios. The dependent variables are women's awareness on the existence of EC and men's awareness on the existence of EC. The independent variables for these two models can be found in Tables 2/3 and consist of individual characteristics (age, education, marital status, unmet need for contraception [women], currently using modern contraception [men] and heard of family planning in past months through TV/radio/newspaper), household characteristics (place of residence), all individual surveys that were pooled and the years of the taken interviews. Religion is intentionally not included in the analysis since there is no standardized religion variable which could be used for a multi-country study. The variable ever had sexual intercourse is used as a control variable.[15]

The variable age is classified into five-year categories starting from 15-19 years old up to 45-49 years old. Education is grouped into: No education, incomplete primary education, complete primary education, incomplete secondary education, complete secondary education, higher then secondary education. Marital status is codified as never married, married (or in union), formerly married (widowed, divorced, separated or have lived with a partner, but not currently living with a partner) or living together. The DHS program codes living together as married, but in this research it is coded separately since this is such a sizeable stand-alone group in the sample. The unmet need for contraception is a dummy which is coded 1 if women have an unmet need for contraception (spacing or limiting). This includes pregnant women whose pregnancy was mistimed/unwanted, postpartum amenorrheic[16] women whose last birth was

[15] Not available for Egypt, Jordan, Pakistan, Turkey and Yemen.
[16] Not menstruating and fully breastfeeding.

mistimed/unwanted, and fecund women who are neither pregnant nor postpartum amenorrheic who are not using any birth control method, but state that they don't want a child within two years/don't want another child/are undecided.[17] Contraceptive failures and infecund/menopausal women are not included. The dummy ever heard of family planning in past months is coded 1 if women gave an affirmative answer to the question if they had seen anything on TV, heard anything on the radio or read anything in a newspaper about family planning in the past months. The place of residence is also a dummy which is either rural or urban. Lastly all individual surveys are coded according to their corresponding countries/phase and added to the regression together with the years of the interviews ranging from 1999-2017. The reference category for the surveys is India 2015-16, because of its huge sample size. The variable ever had sexual intercourse is added as a dummy which controls for people who never had sex. Despite that it is also important for them to be aware about EC, they will have less incentive to get acquainted with family planning and birth control methods such as EC which could muddle the results. The variable unmet need for contraception was not available in the DHS men's datasets. Therefore, the variable currently using any modern contraceptive method is used for the empirical analysis on men's awareness of EC which is coded 1 for the following methods: Pill, IUD, injections, diaphragm, condom, female/male sterilization, Norplant, female condom and foam/jelly. For the analysis on women's awareness, keeping the variable unmet need for contraception was a deliberate choice. Even though this makes the two models less comparable, the group of women in the sample that not currently used a contraceptive method was enormous and was highly correlated with the desire for another child in the near future. Hence, it is difficult to interpret the current usage of contraception, because it is unclear if the reason for not using is an unmet need or the desire for a new child. This leads to the following regression equation formulas:

$$Awareness\ of\ EC\ women = \beta_0 + \beta_1 placeofresidence + \beta_2 agegroups + \beta_3 education + \beta_4 maritalstatus + \beta_5 unmetneed + \beta_6 everhadsex + \beta_7 heardofFP + \beta_8 yearofinterview + \beta_9 surveys + \varepsilon$$

$$Awareness\ of\ EC\ men = \beta_0 + \beta_1 placeofresidence + \beta_2 agegroups + \beta_3 education + \beta_4 maritalstatus + \beta_5 usingmoderncontraceptivemethod + \beta_6 everhadsex + \beta_7 heardofFP + \beta_8 yearofinterview + \beta_9 surveys + \varepsilon$$

Based on Palermo et al, it is possible to formulate some predictions about the effect of our explanatory variables beforehand. They found that the odds of women ever having heard of EC increased with age and education. They also found that these odds enlarged for women who lived in urban areas and they discovered a general pattern suggesting that married women were more likely to ever have heard of EC then never-married women.

The first expectation on the effect of the place of residence is therefore that people in urban areas will have elevated odds for being aware of EC compared to people from rural areas. The second conjecture is that the odds of being aware of EC's existence will increase with age for both men and women. Thirdly, it is postulated that education will have a positive effect on the awareness of EC. Fourthly, it will be presumed that married people and people who are formerly married/formerly living together have a higher chance of being aware of EC then never-married women. The same is expected for people who are living together, but to a lesser extent. The fifth hypothesis is that women with an unmet need are less likely to have heard of EC, because this is a target

[17] Recode manual DHS VII.

group for EC which has remained largely unreached. Notwithstanding that they could potentially benefit the most from EC. For men, this means that the hypothesis is that using a current modern contraceptive method has a positive effect, since the unmet need group will not be using any modern method. Lastly, it is supposed that men and women who have heard about family planning by watching TV, listening to the radio or reading the newspaper in the past months. Although EC is still not a part of family planning programs in a lot of countries, hearing or reading about family planning should have a positive effect on the awareness of EC in the countries that did include it.

5.2 Results

Individual and household characteristics

Table 2 shows the effect of all individual and household characteristics on the awareness of EC for both men and women. This effect is displayed in odds ratios. The results show that men and women in rural areas are substantially less likely to be aware of EC then those from urban areas (0,761; 0,678) which means that rural areas deserve special attention in awareness programs.

All five-year age groups are significant on the 1% level for both men and women. Although all the odds ratios for men are slightly higher than for women, they follow similar patterns. The odds for ever having heard of EC accrue up to age group 30-34 after which they start to decline. All odds are greater than 1 though meaning that the awareness of EC is bigger in all age groups compared to the reference category (15-19). This result implies that the focus group for increasing awareness on EC should be adolescents, but that a special emphasis should also be put on men and women of fertile age who are older than 34.

All education categories are significant at the 1% level and it is fascinating to see the similarity of the odds ratios between men and women. Furthermore, it is evident that the likelihood of having heard of EC increases with the level of education for both men and women. It is also interesting that the odds ratios are rising increasingly for the level of education. This indicates that awareness campaigns should be focused on men and women who are either not or poorly educated.

In contrast to what was presumed, married women (0,919), women who are living together (0,788) and women who are formerly married (0,913) have a lower chance of being aware of EC then never-married women at a 1% significance level. This finding is reassuring, since never married women generally have a higher interest for EC in the developing world. Birth spacing and limiting is unquestionably also important for married women, but they are more dependent on regular contraceptives since they often have sexual intercourse regularly. Therefore, they will only have a use for EC in case of contraceptive failure or incorrect use. Besides that, raising a child and providing for it is easier if you already have a family. For never married women who don't have a partner and don't live with their family, getting pregnant could mean losing their sole source of income. As expected, women who are living together do perform worse than married women in terms of awareness on EC. The odds ratio for married men is insignificant. Formerly married men perform slightly better than never married men, but men who are living together are also the least likely of having heard of EC. The policy implication that can be derived from these results is to give particular notice to men and women who are living together when trying to improve the awareness on EC.

The explanatory dummy variable unmet need for contraception exhibits that women with an unmet need for contraception are less likely to know about the existence of EC at a 1% significance level (0,917). One quarter of women with an unmet need reported

that they don't use birth control, because they have sexual intercourse infrequently (ICEC, 2017). EC could therefore be a valuable solution for this group especially and thus policies should give special notice to them. The dummy for current modern contraceptive modern method shows that men who currently have sexual intercourse where either he and/or his partner uses a modern form of birth control are more likely to have heard about EC on the 1% significance level (1,304). No conclusions will be derived from this result however, since it is unclear which men are not using a modern method intentionally and which are not using a modern method because of an unmet need.
Lastly, Table 2 tells us that men and women who heard about family planning by watching TV, listening to the radio or by reading a newspaper in the past moths are approximately twice times more probable to have ever heard of EC at the 1% significance level which confirms the postulate. Since EC is part of family planning programs in several countries, getting informed on family planning through TV/radio/newspaper thus logically increases the awareness on EC for both men and women. In a lot of countries, EC is however not a part of family planning programs, because of opposition from interest groups, the judiciary or from the government itself. The doubled odds ratio displayed undeniably shows the importance of EC inclusion into family planning programs. And this only concerns information acquired through the media and not even information obtained from family planning clinics or courses.

Global awareness of EC over time

Table 2 further shows the effect of the years in which the surveys were taken. Overall the odds of having heard of EC increased for both men and women over the years 1999 to 2017. However, the odds ratios for women's awareness did experience a drop in 6 of the 18 years compared to the previous one and for men's awareness this was even the case in 10 of the 18 years. Remarkably, there seems to be a peak in the year 2008 after which the odds ratios start to decline for both men and women's awareness until their turnarounds in 2012 (men) and 2013 (women). Coincidently the financial crisis also reached its peak in 2008. A possible explanation could therefore be that resources of governments, NGO's, international agencies, pharmaceuticals and donors got constrained around 2008 which led to a relative decline of awareness on EC in the developing world. This is of course mere guesswork however. It is also discernible that overall men's awareness increased at a higher pace then women's.
Table 3 then displays the odd ratios for all individual surveys which reveals the fluctuations in awareness of EC over time for all countries that have undergone multiple surveys. A first observation that can be made is that of the 41 countries with a significant odds ratio for at least two surveys, 22 countries have experienced at least one decline in their odds ratios for women's awareness over time. This means that in most these countries, there was at least one period between 1999 and 2017 in which the likelihood of women being aware of EC had decreased. This is surprising, since the percentages of women having ever heard of EC predominantly appeared to go up based on the DHS summary statistics.[18] Thus the positive trend in awareness of EC that is often mentioned ceases to exist when taking individual characteristics, household characteristics, years and individual surveys into account. Similar results are found for men's awareness of EC. From the 26 countries with a significant odds ratio for at least two men's surveys, 11 countries have experienced at least one decline in their odds ratios over time.

[18] Minor exceptions: Zambia (2007), Egypt (2008), Benin (2006), Nigeria (2008), Philippines (2008) and Peru (2009-2012).

Regional differences

Although there are not enough surveyed countries in the sample to make them representational for their regions, it is nevertheless interesting to look at the regional differences. To analyze the effects of all regions on the awareness of EC the same regressions to the ones mentioned in section 5.1 were run except that regional dummies were added instead of the individual surveys.[19] The results showed that Latin America and the Caribbean substantially outperforms the other regions in women's awareness with an odds ratio of 21,839 followed by Eastern Africa (11,657), Southern Africa (8,623) and Western Africa (8,259). The worst performing regions are Central Africa (7,869), Asia (6,648) and Europe and West-Asia (5,683).

For men's awareness, Eastern Africa was the best performing region with an odds ratio of 0,905 followed by Southern Africa (0,804), Europe and West Asia (0,766) and Western Africa (0,701). The worst performing regions for male awareness were Central Africa (0,613) and Asia (0,584). Latin America and the Caribbean unfortunately got omitted in the analysis for men's awareness. When leaving LAC out of account, it appears that the regions for men's and women's awareness follow the same ranking in performance with the only exception being Europe and West Asia which scores significantly better in men's awareness than in women's awareness.

Asia

It is peculiar that the odds ratios for women's awareness did rise in 86% of the Asian countries in the sample that could be analyzed over time (Cambodia, India, Indonesia, Nepal, Pakistan and Timor-Leste). Only in the Philippines there was a small decrease from 2008 to 2013. Nevertheless, Asia performed very poorly on women's awareness compared to other regions which could mean that not much effort was needed for an increase in awareness over time. The lowest women's odds ratios in Asia come from the Philippines and Timor-Leste which are also the only Asian countries in the sample where the population is mainly Christian with approximately 85% and 99,6% respectively. Table 4 shows the religion compositions by country. The countries from the sample that are dominated by Buddhism are Cambodia (96,9%) and Myanmar (80,1%) which also have very low odds ratios. The Islamic countries in the sample Kyrgyz Republic (88%), Maldives (98,4%), Pakistan (96,4%) and Tajikistan (96,7%) clearly have the highest odds ratios. The only exception here is Indonesia (87,2% Islam), but they did improve almost fivefold from 2007 to 2012.

The men's awareness solely increased in 75% of the Asian countries in the sample that could be analyzed over time (India, Nepal, Timor-Leste). Only Indonesia has undergone a minor decrease. The men's odds ratios are among the lowest in the Philippines and Timor-Leste, but Indonesia is also at the bottom. The countries with a Hindu majority are India (79,5%) and Nepal (80,7%) which have especially high odds ratios for men's awareness of EC together with Maldives.

Europe and West-Asia

Unfortunately, there were only two countries from Europe and West-Asia that could be analyzed over time for women's awareness. Armenia experienced a decrease in women's odds ratio in 2010, but increased again in 2015-16 and Jordan had an increased odds ratio in 2012. Armenia has the biggest percentage of Christians of all countries in the sample (98,5%) and has very low odds ratios. However, Azerbaijan and Jordan are both Muslim countries (96.9%, 97.2% respectively) and they are also among the lowest in the sample. Azerbaijan even has the second lowest average odds ratio of

[19] Results not reported.

all countries. The best performing countries here are Moldova (97.4% Christian), Turkey (98% Muslim) and Ukraine (83.8% Christian). Clearly, there is thus more to the story then just religion.
For men's awareness, similar results are found for the countries on which men's data was available. In Armenia, men's awareness declined in 2010 and Armenia performed the worst together with Azerbaijan.

Latin America and the Caribbean
Many Latin American and Caribbean countries perform exceptionally well on both men's and women's awareness of EC compared to countries from other regions. All countries from the sample are predominantly Christian so it is not possible to analyze the results in light of the religion of countries. What we can observe though is that in terms of women's awareness, the worst performing country on average is Guyana which has the least share of Christians. Bolivia and Guatemala are also at the bottom. Although the rest of the countries all have outstandingly high women's odds ratios, the Dominican Republic, Honduras and Nicaragua undoubtedly take the biscuit. The Dominican Republic even has the two highest odds ratios of all countries in the sample in 2002 (6,696) and in 2013 (9,414). Despite these results however, four out of six countries still experienced at least one decline in women's awareness over time. Only in Colombia and Honduras was the awareness constant or rising for all subsequent surveys. For men's awareness, it was only possible to analyze Bolivia over time, where there was an infinitesimal increase in awareness from 2003/04 to 2008. When further examining men's awareness, it becomes clear that The Dominican Republic also has the best result of all countries in the men's sample in 1999 and that Honduras is second-best in 2011/12. Bolivia and Guyana have the smallest odds ratios of the Latin American and Caribbean countries. The results for men and women are thus very similar here.

Africa
More than half of all the surveys with data on awareness of EC comes from Africa which is why the most extensive analysis can be done here. In total, 16 out of the 26 African countries that could be analyzed over time experienced at least one drop in awareness of EC. For men, this was 9 out of 20. Africa is divided into sub regions Northern, Eastern, Southern, Western and Central Africa for clarity. Interestingly, half of all the countries that solely improved their women's awareness on EC comes from Western Africa (Guinea, Liberia, Niger, Senegal and Sierra Leone) which is 50% of all Western African countries in the sample. Of these countries Liberia is the only one that is not dominated by Islam. Furthermore, 3 countries that solely improved came from Central Africa which is 75% of all countries from this region in the sample (Congo, Congo Democratic Republic and Gabon). The last 2 only improving are Rwanda (Eastern Africa) and Lesotho (Southern Africa). This means that merely 12,5% of all Eastern African countries that could be analyzed over time did not experience at least one decline in women's awareness on EC. Eastern Africa is however the best performing African region which could have made increasing awareness overtime more difficult. It's not possible to interpret the results on Northern Africa, since Egypt is the only country in the sample from this region. However, it can be observed that Egypt not only experienced a drop in women's awareness of EC, but also that it has the lowest women's average odds ratio of all countries analyzed. The overtime awareness of African subregions will not be compared for men's awareness, since there is no sizeable data on most of them. What can be perceived is that most countries which only experienced an increase in men's awareness come from Western-Africa, but also from Eastern Africa where 50% of all countries that could be analyzed over time did not

experience at least one decline in men's awareness on EC which is significantly more than for women. The far majority of African countries in the sample is Christian, but what is surprising is that the 8 lowest women's odds ratios on the African continent are all from mainly Islamic countries which is one third of all primarily Islamic African countries in the sample.[20] In the top 20% best women's odds ratios there are only 2 out of 20 Islamic countries (10%).[21] When comparing men's awareness of EC in Africa with religion, it becomes clear that there are only 4 out of 17 predominantly Islamic countries in the top half of all African men's odds ratios which is merely 24%.[22] This is surprising since the Islamic countries in Asia greatly outperformed the Christian ones. Although religion thus has an influence on the awareness of EC, it has hard to grasp the effect of certain religions globally. A plausible explanation for this could be that similar religions differ markedly between regions. Clearly there are big differences between the Sunni, Shia and the Kharijite Islam just as there are vast differences between all Christian denominations.

6. Conclusion

Infrequent sex, contraceptive failure, incorrect use and neglecting the use of a contraceptive method are global occurrences. Although EC is only filling a niche in the family planning mix, it should thus be accessible worldwide to assure women's reproductive health and rights. Luckily, hindrances to the access of EC have become rather the exception than the rule in the developed world. Most developed countries currently provide EC through the public sector, adopted EC into their family planning programs and experienced a substantial increase in awareness of EC in the past twenty years.

Section 3 however revealed that there are still many impediments to the access of EC in developing countries where regulation is far from desirable. Governments, NGO's, donors, international organizations and pharmaceuticals should therefore bundle their strengths to get EC registered in the remaining 47 countries and to get a dedicated EC product over-the-counter available without age restrictions at an affordable price all over the world. Furthermore, they should strive to get EC provided through public sector facilities and to get EC included into all national and social marketing programs on family planning. Lastly, they should fight to get EC included on all National Essential Medicine Lists to mandate its availability in public health facilities.

In the meanwhile, NGO's, International Organization and donors play a vital role in supplying EC in countries where the access to EC is obstructed, despite that there is a demand for it. This is because regulation is not always a response to demand and therefore laws do not always change when a society wants them to change. It is explained in this paper why governments that are willing to implement EC regulation to improve the access to EC will face a lot of difficulties pushing this regulation through if the prevailing norms within their societies do not approve. And even if they manage to get this regulation approved, this will have no effect on the awareness, use and accessibility of EC if it is not in accordance with the norms of their society. Regulation requires respect as well as support from the populace and thus it should serve the needs of the populace. That is why a change of culture is needed to structurally improve the access to EC. The first step in realizing this is to create awareness of the existence of EC within a society. Although the DHS survey summaries initially suggested that

[20] Egypt (2005, 2008, 2014), Sierra Leone (2008), Guinea (2005), Chad (2004, 2014-15) and Niger (2006).
[21] Malawi (2000+2004-05) and Comoros (2012).
[22] Gambia (2013), Niger (2006), Mali (2006) and Comoros (2012).

awareness of EC was increasing rapidly in the developing world, the analysis in this paper proofs that women's awareness has stagnated or have even decreased for many developing countries when the year of the interview and some simple individual and household characteristics are included in the model. This is alarming since the developing countries are the ones who need EC the most, because they generally have higher unmet need for contraception, more unsafe abortions, higher rape rates, more crisis situations and more maternal and infant deaths (Guttmacher Institute 2017; WHO 2018; Harrendorf 2010; Alcantara-Ayala 2002). Luckily, it is also possible to derive some policy implications from the model to structurally increase the awareness of EC. Policies should especially focus on people who are the least likely to have heard of EC to have the biggest impact. These are people living in rural areas, adolescents, people of fertile age who are older than 34, people who are either not or poorly educated, people who are living together (not married or formerly married) and women with an unmet need for contraception. Besides this, the results confirm the importance of including EC into family planning programs since the likelihood for people who heard about family planning through TV/radio/newspaper in past months had doubled. Furthermore, a focus should be put on Asia and on the predominantly Christian Asian countries specifically. On the African continent, emphasis should be put on Central Africa and on the Islamic countries instead. Table 3 shows which countries specifically need special attention, but noteworthy are Egypt, Azerbaijan, Philippines, Timor-Leste and Chad who have by far the worst performing odds ratios on average. Nevertheless, people all over the world should not only be aware of the existence of EC, but they should also know how to obtain it and how to safely use it. As has become clear, the opposition of societies towards EC is commonly based on misconceptions[23] and thus breaking the taboo by informing people will eventually be the key for making EC broadly accessible.

The analysis in this paper included all data available on EC so far. The DHS program is recommended to keep the awareness of EC included into their surveys and to put the ever-used EC variable back in. Additionally, it would be good for future analysis if they could include a standardized variable for religion and if they managed to find a way to test respondent's knowledge of EC instead of awareness. Lastly, it would also be valuable if they would ask all their respondents who ever used EC where they obtained it just like they did in India's most recent survey. Avenues for further research will be more in depth analyses of certain countries as to find out why some are underperforming and others are excelling in terms of awareness on EC.

[23] It is proven that EC does not have a post-fertilization effect, notwithstanding this is the main reason that the Catholic Church is still against EC.

7. Figures

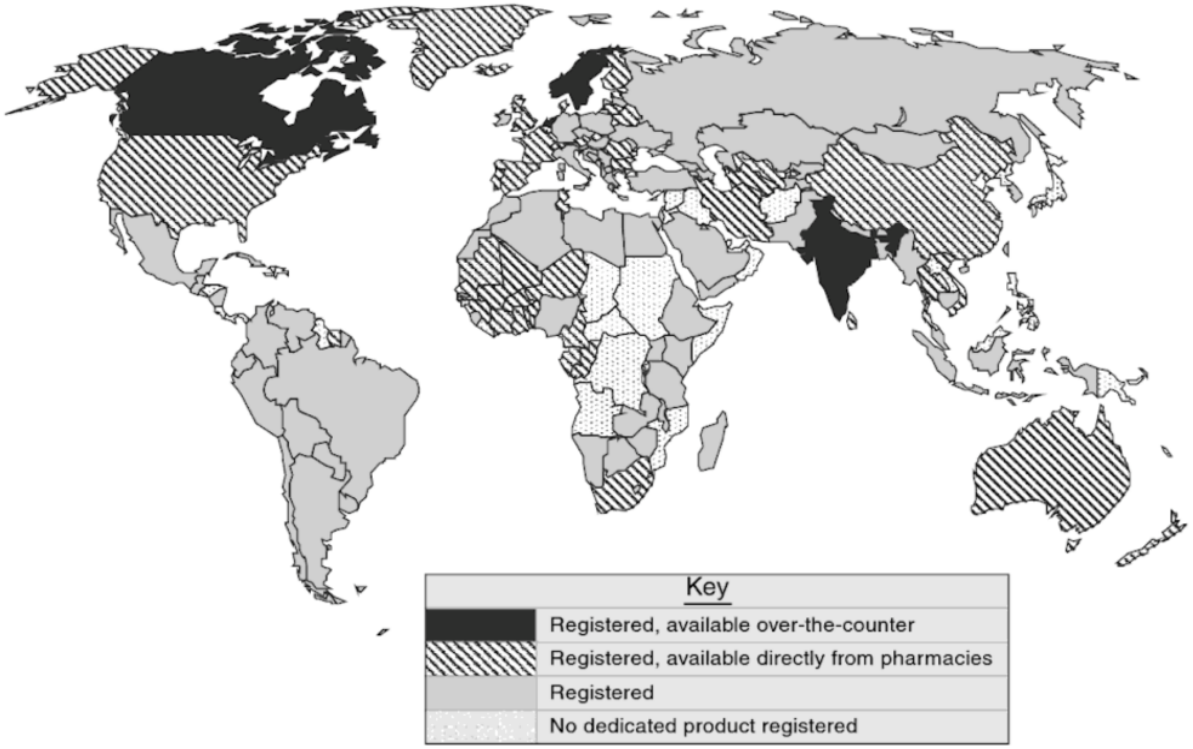

Figure 1: Registration status on ECP worldwide (2012).
Source: Foster, A., & Wynn, L. (2012). Emergency contraception: the story of a global reproductive health technology. Springer.

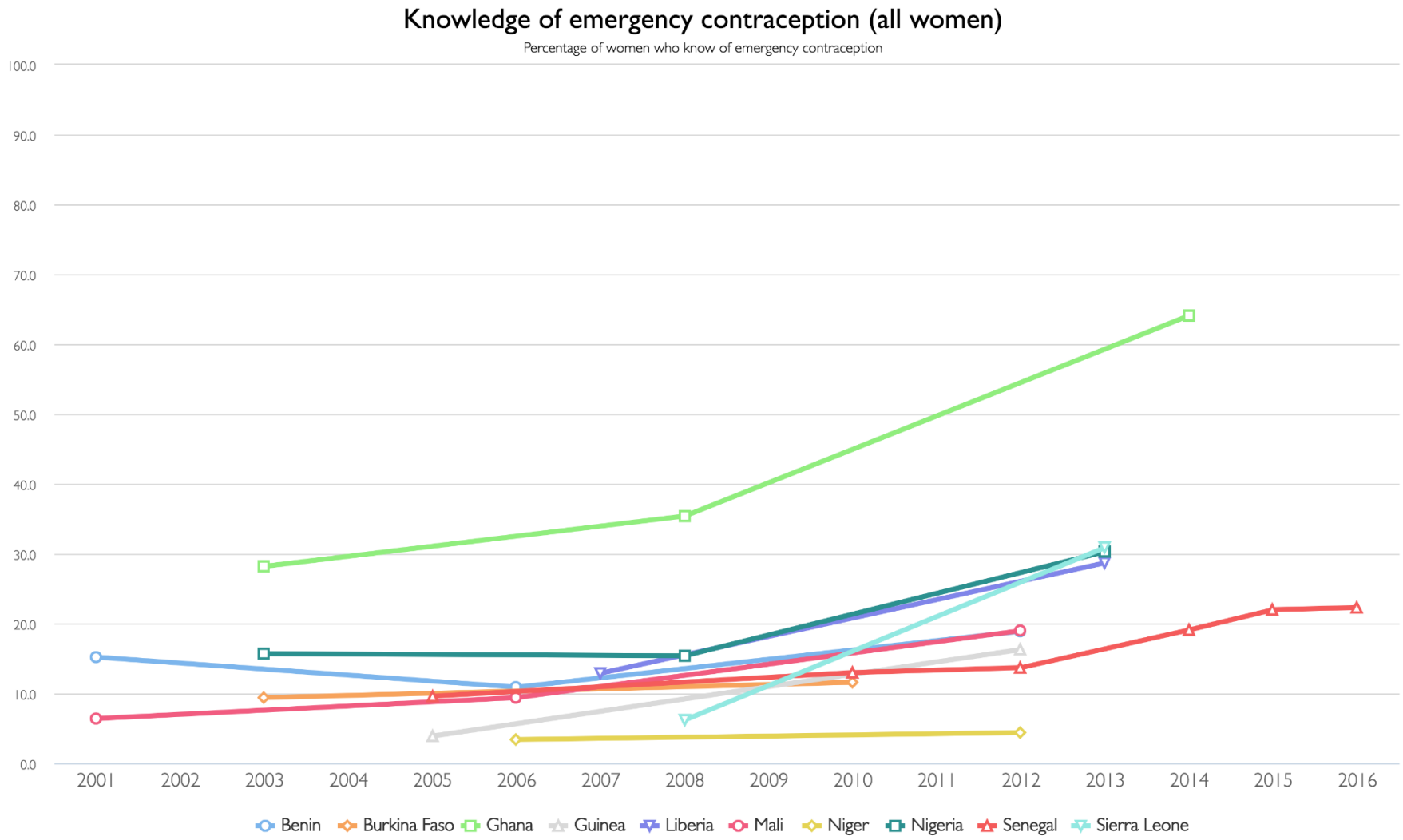

Figure 2: Western Africa.
Source: Authors calculation using Statcompiler. URL: https://www.statcompiler.com

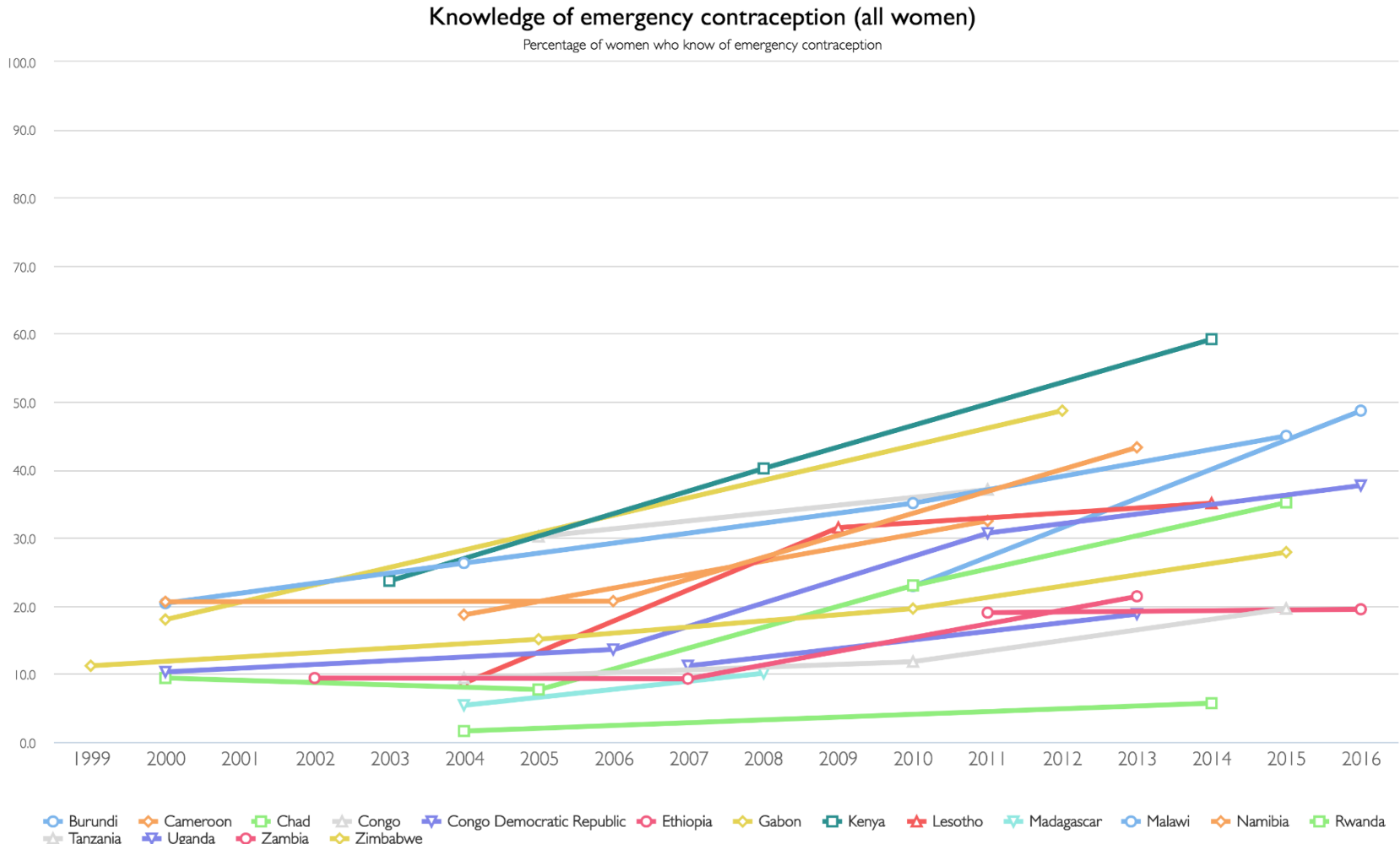

Figure 3:Eastern, Central and Southern Africa.
Source: Authors calculation using Statcompiler. URL: https://www.statcompiler.com.

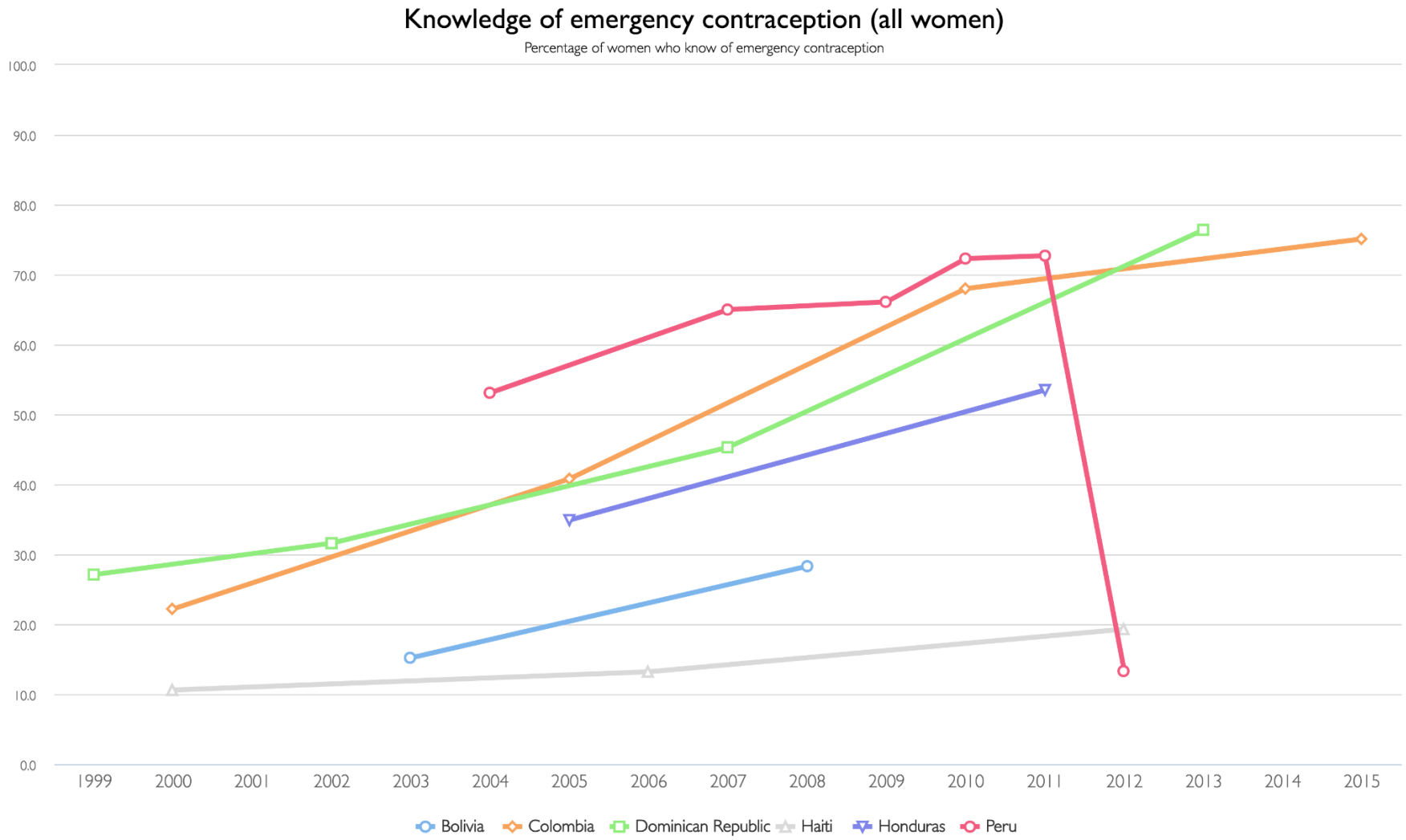

Figure 4: Latin America and the Caribbean.
Source: Authors calculation using Statcompiler. URL: https://www.statcompiler.com.

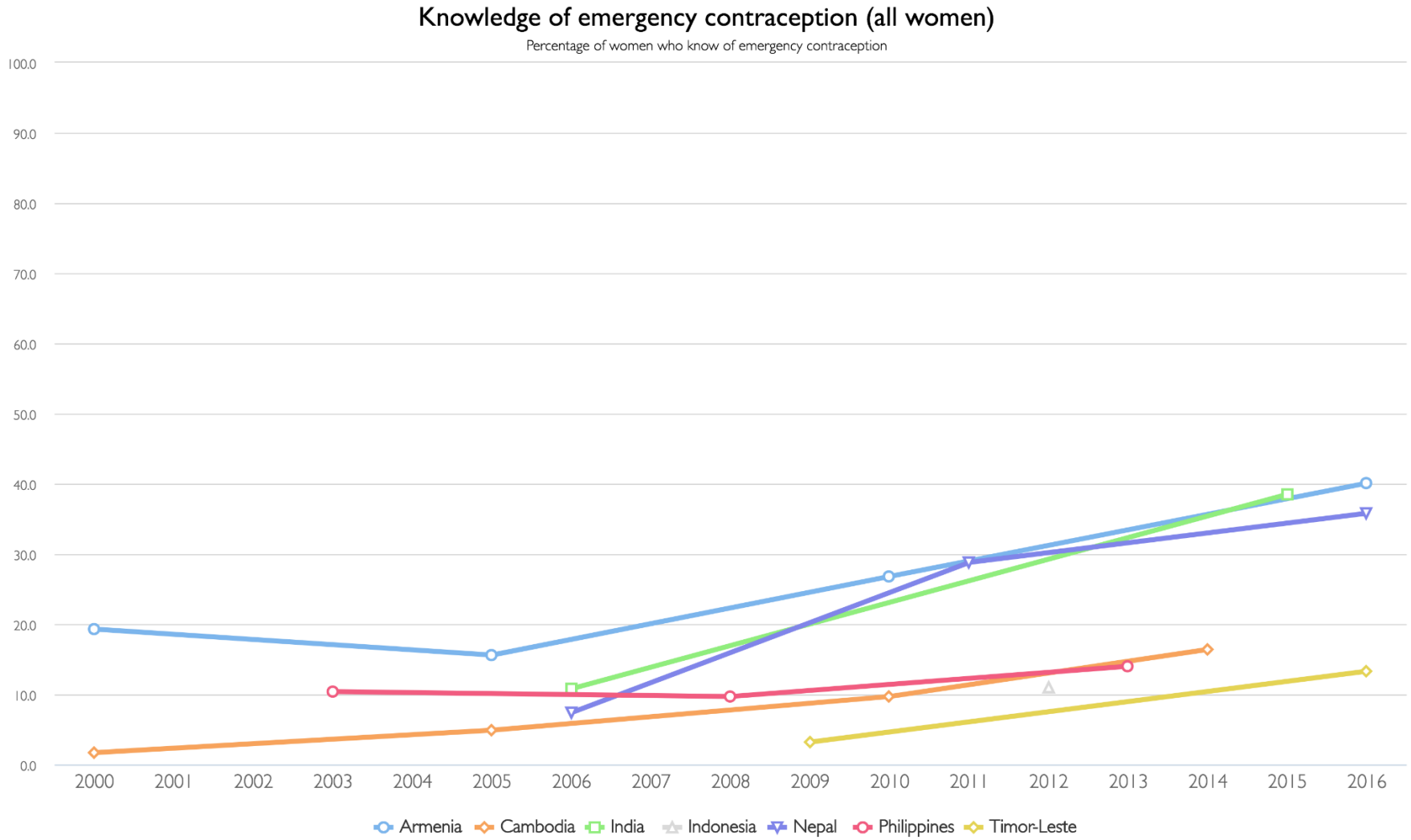

Figure 5: Asia.
Source: Authors calculation using Statcompiler. URL: https://www.statcompiler.com.

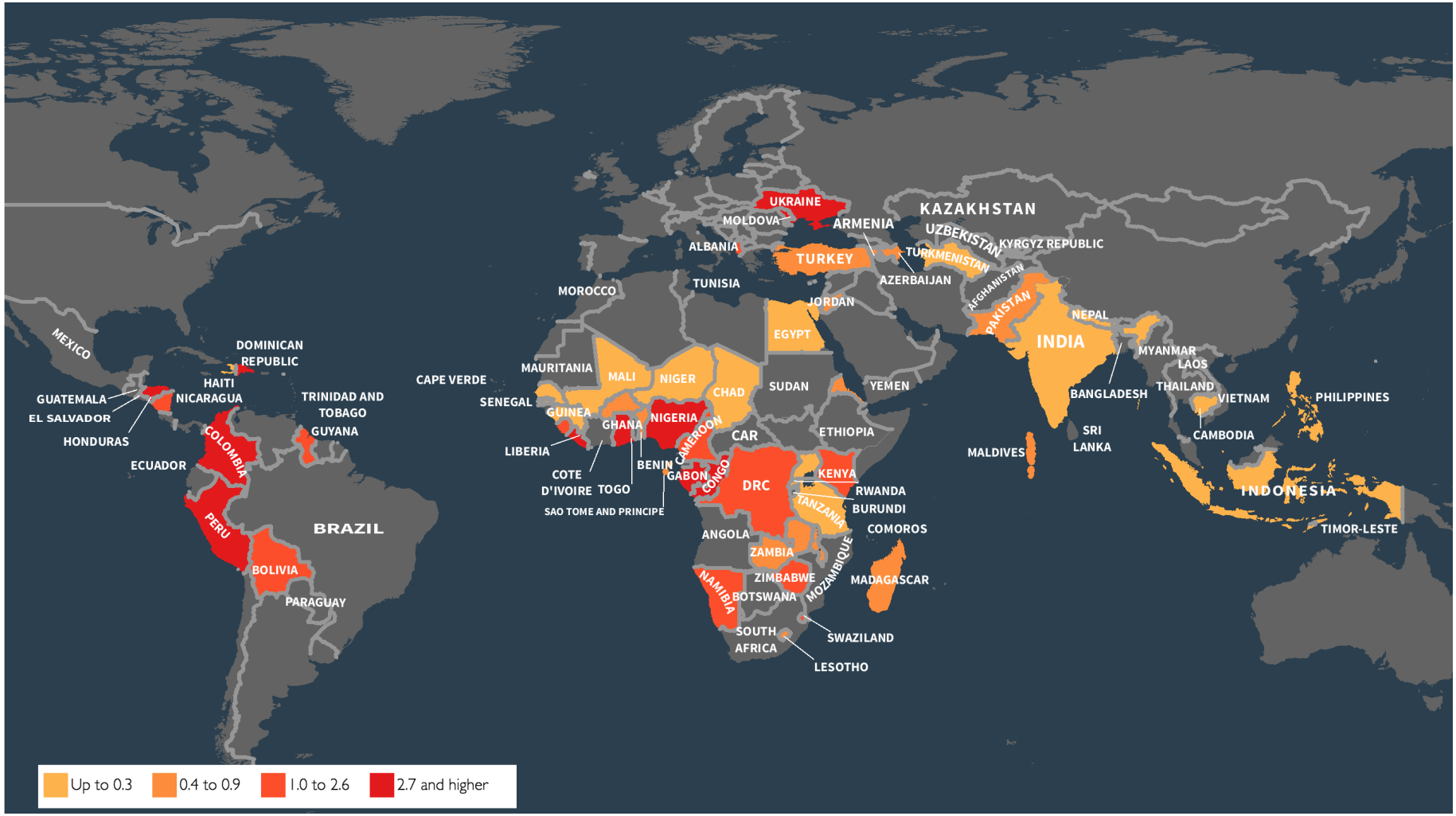

Figure 6: Percentage of all women who have ever used EC divided in quantiles based on most recent DHS survey data.
Source: Authors calculation using Statcompiler. URL: https://www.statcompiler.com.

8. Tables

Table 1:
Differences concerning the supply and regulation of EC across countries.
Source: Data obtained from: Status and availability database from ICEC, Contraceptive Security Indicators 2015 from the USAID Deliver Project.

	EC through Private sector	EC through Public sector	EC through NGO's	EC in Social Market-ing	Lowest level provider EC Public sector	Lowest level provider EC Private sector	EC on NEML	EC stocked out central level last year	At least one registered EC product	Import of EC	Age restriction on EC	Over-the-counter (OTC) sale EC	Non-Prescription status EC	Price EC Private sector
Africa														
Angola	-	-	-	-	-	-	-	-	No	Yes	-	No	No	$32 (2014)
Benin	Yes	No	Yes	Yes	Nurse	Nurse	No	No	Yes	N/A	-	No	Yes	$1.04 - $6.25 (2013)
Burkina Faso	Yes	No	Yes	No	N/A	Nurse	No	N/A	Yes	N/A	-	No	Yes	$7.45 (2014)
Burundi	Yes	Yes	Yes	No	Aux. Nurse	Pharmacist	Yes	No	No	Yes	-	No	No	-
Cameroon	Yes	No	Yes	No	Nurse	Nurse	No	N/A	Yes	N/A	-	No	Yes	$1.55 - $6.86 (2014)
Cambodia	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-
Chad	-	-	-	-	-	-	-	-	Yes	N/A	-	No	Yes	-
Comoros	-	-	-	-	-	-	-	-	No	Yes	-	No	No	-
Congo	-	-	-	-	-	-	-	-	Yes	N/A	-	No	Yes	-
Côte d'Ivoire	Yes	Yes	Yes	Yes	Midwife	Pharmacist	Yes	Yes	Yes	N/A	-	No	Yes	-
DR Congo	Yes	Yes	Yes	No	Clin. Officer	Clin. Officer	Yes	No	Yes	N/A	-	No	No	$1.21-$3.30 (2016)
Egypt	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-
Ethiopia	Yes	Yes	Yes	Yes	Health Worker	Nurse	Yes	No	Yes	N/A	No	No	Yes	$0.49
Gabon	-	-	-	-	-	-	-	-	Yes	N/A	-	No	Yes	-
Gambia	-	-	-	-	-	-	-	-	No	Yes	-	No	No	-
Ghana	Yes	Yes	Yes	Yes	CHW*	CHW*	Yes	Yes	Yes	N/A	No	No	Yes	$1.20 - $5.78 (2014)
Guinea	Yes	Yes	Yes	Yes	Aux. nurse	Clin. Officer	Yes	No	Yes	N/A	-	No	Yes	$0.73 - $9.50 (2013)
Kenya	Yes	Yes	Yes	No	Nurse	Nurse	Yes	Yes	Yes	N/A	No	No	Yes	$1.15 – $2.30 (2013)
Lesotho	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-
Liberia	Yes	Yes	Yes	No	Midwife, Nurse	Aux. Nurse	Yes	N/A	Yes	N/A	-	No	No	-
Madagascar	Yes	Yes	Yes	No	Aux. Nurse	Aux. nurse	Yes	No	Yes	N/A	-	No	Yes	-
Malawi	Yes	Yes	Yes	Yes	Midwife	Midwife	Yes	No	Yes	N/A	-	Yes	Yes	$2-$3 (2015)
Mali	Yes	No	No	No	N/A	-	No	N/A	Yes	N/A	-	No	Yes	-
Mozambique	Yes	No	No	Yes	Nurse	Nurse	Yes	No	Yes	N/A	No	No	Yes	$1.20 - $3 (2015)
Namibia	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-

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Source: Data obtained from: Status and availability database from ICEC, Contraceptive Security Indicators 2015 from the USAID Deliver Project.

	EC through Private sector	EC through Public sector	EC through NGO's	EC in Social Market-ing	Lowest level provider EC Public sector	Lowest level provider EC Private sector	EC on NEML	EC stocked out central level last year	At least one registered EC product	Import of EC	Age restriction on EC	Over-the-counter (OTC) sale EC	Non-Prescriptio n status EC	Price EC Private sector
Niger	Yes	No	No	No	N/A	Clin. Officer	Yes	N/A	Yes	N/A	-	No	Yes	-
Nigeria	Yes	No	Yes	Yes	N/A	Nurse	No	N/A	Yes	N/A	No	No	Yes	$1.00 (2016)
Rwanda	Yes	No	Yes	No	N/A	Nurse	Yes	N/A	Yes	N/A	-	No	No	-
Sao Tome	-	-	-	-	-	-	-	-	No	Yes	-	No	No	-
Senegal	Yes	Yes	Yes	No	Aux. Nurse	Aux. nurse	Yes	No	Yes	N/A	No	No	No	$7.50 (2014)
Sierra Leone	Yes	Yes	Yes	No	Aux. nurse	Aux. nurse	Yes	No	Yes	N/A	-	No	No	-
Swaziland	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-
Tanzania	Yes	Yes	No	Yes	Aux. Nurse	-	Yes	N/A	Yes	N/A	-	No	No	$5.00
Togo	Yes	Yes	Yes	No	Aux. Nurse	Aux. Nurse	No	Yes	Yes	N/A	-	No	No	-
Uganda	Yes	Yes	Yes	No	-	-	Yes	No	Yes	N/A	-	No	No	-
Zambia	Yes	Yes	Yes	No	Nurse	-	Yes	No	Yes	N/A	-	No	No	-
Zimbabwe	Yes	Yes	Yes	Yes	Nurse	Nurse	Yes	No	Yes	N/A	-	No	No	-
Asia														
Afghanistan	No	No	No	No	N/A	N/A	No	-	No	Yes	-	No	No	-
India	Yes	Yes	Yes	Yes	CHW*	Pharmacist	Yes	No	Yes	N/A	No	Yes	Yes	$0.03 - $1.60 (2013)
Indonesia	Yes	No	Yes	Yes	N/A	Midwife	No	N/A	Yes	N/A	-	No	No	-
Kyrgyz Rep.	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	-
Maldives	-	-	-	-	-	-	-	-	No	Yes	-	No	No	-
Myanmar	-	-	-	-	-	-	-	-	Yes	N/A	-	No	No	$0.60 - $2.93 (2014)
Nepal	Yes	No	Yes	Yes	N/A	Pharmacies	Yes	N/A	Yes	N/A	-	Yes	Yes	$1-$2 (2013)
Pakistan	Yes	Yes	Yes	Yes	Aux. Nurse	Aux. nurse	Yes	No	Yes	N/A	No	Yes	Yes	-
Philippines	-	No	-	-	N/A	N/A	No	N/A	No	No	N/A	N/A	N/A	N/A
Tajikistan	-	-	-	-	-	-	-	-	Yes	N/A	No	Yes	Yes	$2.99 - $7.81 (2016)
Timor-Leste	-	-	-	-	-	-	-	-	No	No	N/A	N/A	N/A	N/A

Table 1:
Differences concerning the supply and regulation of EC across countries.
Source: Data obtained from: Status and availability database from ICEC, Contraceptive Security Indicators 2015 from the USAID Deliver Project.

	EC through Private sector	EC through Public sector	EC through NGO's	EC in Social Market-ing	Lowest level provider EC Public sector	Lowest level provider EC Private sector	EC on NEML	EC stocked out central level last year	At least one registered EC product	Import of EC	Age restriction on EC	Over-the-counter (OTC) sale EC	Non-Prescription status EC	Price EC Private sector
Europe and West Asia														
Albania	-	-	-	-	-	-	-	-	Yes	N/A	No	No	No	$4.80 (2015)
Armenia	Yes	Yes	No	-	Doctor	Pharmacist	No	Yes	Yes	N/A	-	Yes	Yes	-
Azerbaijan	-	-	-	-	-	-	-	-	Yes	N/A	-	Yes	Yes	-
Jordan	-	-	-	-	-	-	-	-	No	No	N/A	N/A	N/A	N/A
Moldova	-	-	-	-	-	-	-	-	Yes	N/A	-	Yes	Yes	-
Turkey	-	-	-	-	-	-	-	-	Yes	N/A	No	No	No	$7.75 (2013)
Ukraine	Yes	Yes	No	No	Midwife/nurse	Doctor	Yes	-	Yes	N/A	-	No	No	-
Yemen	-	No	No	No	N/A	-	No	N/A	Yes	N/A	-	No	No	-
Latin America and the Caribbean														
Bolivia	-	-	-	-	-	-	-	-	Yes	N/A	No	No	No	$8.00 (2014)
Colombia	-	-	-	-	-	-	-	-	Yes	N/A	No	No	No	-
Dom. Rep.	Yes	No	Yes	Yes	N/A	Aux. Nurse	No	N/A	Yes	N/A	No	Yes	Yes	-
Guatemala	Yes	Yes	Yes	No	Clin. Officer	-	Yes	No	Yes	N/A	No	No	No	-
Guyana	-	-	-	-	-	-	-	-	Yes	N/A	-	Yes	Yes	$5-$12.5 (2013)
Haiti	Yes	Yes	Yes	No	CHW*	Aux. nurse	Yes	No	No	Yes	-	No	No	-
Honduras	No	No	No	No	N/A	N/A	No	N/A	No	No	N/A	N/A	N/A	N/A
Nicaragua	Yes	No	Yes	Yes	N/A	Doctor	Yes	N/A	Yes	N/A	No	No	No	-
Peru	Yes	No	Yes	-	Doctor	Pharmacist	Yes	N/A	Yes	N/A	No	No	No	-

*CHW: Community Health Worker.

Table 2:
Individual/household characteristics and years influencing the awareness on EC.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Individual/household characteristics and years	N Women	N Men	Odds Ratios Women	Odds Ratios Men
Place of residence				
Urban (ref)	1,161,825	295,464	1.000	1.000
Rural	1,676,906	440,570	0.678***	0.761***
Age				
15-19 (ref)	538,357	143,673	1.000	1.000
20-24	496,149	113,433	1.246***	1.396***
25-29	469,249	103,522	1.396***	1.566***
30-34	399,487	92,553	1.438***	1.595***
35-39	359,690	84,183	1.401***	1.544***
40-44	301,525	72,004	1.350***	1.535***
45-49	263,533	62,747	1.266***	1.483***
Education				
No education (ref)	676,965	121,108	1.000	1.000
incomplete primary	476,461	138,954	1.172***	1.171***
complete primary	271,601	73,869	1.516***	1.532***
incomplete secondary	782,674	244,199	2.207***	2.247***
complete secondary	303,288	76,96	3.385***	3.407***
higher	296,134	80,824	5.586***	5.397***
Marital status				
Never married (ref)	720,393	284,564	1.000	1.000
married	1,625,824	373,192	0.919***	0.992
Formerly married	215,945	25,787	0.913***	1.054***
Living together	276.501	52,48	0.788***	0.924***
Unmet need				
No unmet need (ref)	2,475,357		1.000	-
Unmet need	363,374		0.917***	-
Currently using modern contraceptive method				
No current modern method (ref)		559,411	-	1.000
Currently using modern method		176,623	-	1.304***
Ever had sexual intercourse				
Never had sex (ref)	532,756	161,211	1.000	
Had sex	2,305,975	574,823	2.014***	1.512***
Heard of FP last months (TV/radio/newspaper)				
Did not hear about FP in last months (ref)	1,357,545	297,951	1.000	1.000
Hear about FP in last months	1,481,186	438,083	1.992***	2.020***

Table 2:
Individual/household characteristics and years influencing the awareness on EC.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Individual/household characteristics and years	N Women	N Men	Odds Ratios Women	Odds Ratios Men
Year				
1999	7,193	3,721	1.000	1.000
2000	83,705	14,936	1.209***	3.747***
2001	37,399	7,528	0.735***	2.694***
2002	35,422	4,528	0.488***	2.911***
2003	86,078	39,62	1.956***	4.929***
2004	73,524	11,108	2.300***	4.524***
2005	159,331	25,127	3.220***	4.274***
2006	243,029	98,843	3.529***	3.744***
2007	125,482	32,518	3.918***	2.255***
2008	153,958	48,868	5.095***	9.984***
2009	92,727	22,243	4.914***	8.817***
2010	175,024	25,145	5.646***	6.237***
2011	117,336	36,492	4.163***	5.477***
2012	204,397	42,555	1.224***	5.821***
2013	177,106	56,877	3.443***	8.809***
2014	130,254	41,494	4.985***	7.714***
2015	482,217	122,379	5.132***	7.710***
2016	447,292	98,691	6.979***	9.863***
2017	7,257	3,361	6.841***	9.900***

Table 3:
Female/Male Awareness of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N surveyed Women	% heard of Women	N surveyed Men	% heard of Men	Odds Ratios Women	Odds Ratios Men
Central Africa							
Angola	2015-16	14,379	28.3	5,422	30	0.569***	0.419***
Cameroon	2004	10,656	18.7	-	-	1.074	-
Cameroon	2011	15,426	32.5	6,455	33.5	1.256***	1.545***
Chad	2004	6,085	1.6	1,682	8.2	0.189***	0.368***
Chad	2014-15	17,719	5.7	4,715	14.7	0.187***	0.383***
Congo	2005	7,051	30.2	-	-	1.223***	-
Congo	2011-12	10,819	37.1	4,723	36.5	1.861***	1.847***
Congo Dem. Rep.	2007	9,995	11.2	4,316	12.1	0.407***	0.947
Congo Dem. Rep.	2013-14	18,827	18.8	7,755	22.4	0.652***	0.354***
Gabon	2000	6,183	18	1,829	17.9	1.136**	0.521***
Gabon	2012	8,422	48.7	5,108	37.2	4.094***	1.162***
Sao Tome and Principe	2008-09	2,615	17.5	2,078	14.4	0.350***	0.160***
Average		**10,681**	**22.4**	**4,408**	**22.7**	**-**	**-**
Eastern Africa							
Burundi	2010-11	9,389	22.9	3,760	43.8	0.963***	1.692***
Burundi	2016-17	17,269	48.7	6,687	47.1	2.410	2.363***
Comoros	2012	5,329	29.1	1,999	38.7	4.689***	1.424***
Ethiopia	2011	16,515	19	12,834	27.4	2.015***	1.588***
Ethiopia	2016	15,683	19.5	11,606	31	0.867***	0.729***
Kenya	2003	8,195	23.7	3,363	25.6	2.361***	0.896
Kenya	2008-09	8,444	40.2	3,258	35.7	1.196***	0.604***
Kenya	2014	31,079	59.2	12,063	62.5	2.616***	1.891***
Madagascar	2003-04	7,949	5.4	2,216	3	0.314***	0.123***
Madagascar	2008-09	17,375	10.1	7,645	7.3	0.309***	0.175***
Malawi	2000 + 2004-05	24,918	23.4	6,029	21.5	2.171***	1.007
Malawi	2010	23,020	35.1	6,818	-	1.200***	-
Malawi	2015-16	24,562	45	7,128	47.4	2.000***	1.353***
Mozambique	2011	13,745	9.5	3,512	21.6	0.349***	0.848***
Rwanda	2000 + 2005	21,742	8.5	6,945	12.9	0.688***	0.745***
Rwanda	2010-11+2014-15	27,168	29.1	11,264	45.3	1.119***	1.829***
Tanzania	2004-05	10,329	9.4	2,635	11.6	0.385***	0.461***
Tanzania	2009-10	10,139	11.8	2,527	11.9	0.250***	0.333***
Tanzania	2015-16	13,266	19.6	3,514	20.4	0.408***	0.335***
Uganda	2000-01	7,246	10.3	1,879	18.6	1.340***	0.953
Uganda	2006	8,531	13.6	2,385	14.5	0.530***	0.644***
Uganda	2011	8,674	30.7	2,173	37.1	1.164***	1.462***
Uganda	2016	18,506	37.7	5,037	46.6	0.984	1.188***
Zambia	2001-02	7,658	9.4	1,974	15.4	1.827***	0.818
Zambia	2007	7,146	9.3	5,995	11.4	0.221***	0.606***

Table 3:
Female/Male Awareness of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N surveyed Women	% heard of Women	N surveyed Men	% heard of Men	Odds Ratios Women	Odds Ratios Men
Zambia	2013-14	16,411	21.4	13,561	20	0.692***	0.308***
Average		**14,626**	**23.1**	**5,732**	**27.1**	**-**	**-**
Northern Africa							
Egypt*.♦	2005	19,474	6.3	-	-	0.105***	-
Egypt*.♦	2008	16,527	5.3	-	-	0.060***	-
Egypt*.♦	2014	21,762	6.5	-	-	0.076***	-
Average		**19,254**	**6.0**	**-**	**-**	**-**	**-**
Southern Africa							
Lesotho	2004-05	7,095	8.7	2,496	6.9	0.422***	0.275***
Lesotho	2009-10	7,624	31.5	3,008	25.7	0.932**	0.640***
Lesotho	2014	6,621	35.1	2,660	28.9	0.946	0.707***
Namibia	2000	6,755	20.6	2,766	26.4	2.277***	1.895***
Namibia	2006-07	9,804	20.7	3,915	25.4	0.382***	1.069
Namibia	2013	9,176	43.3	4,021	46.1	1.455***	0.994
Swaziland	2006-07	4,987	25.7	4,156	21.8	0.713***	0.935
Zimbabwe	1999	5,907	11.2	2,505	11.3	omitted	omitted
Zimbabwe	2005-06	8,907	15.1	6,863	25.3	0.581***	omitted
Zimbabwe	2010-11	9,171	19.6	7,110	29.3	0.453***	0.793***
Zimbabwe	2015	9,955	27.9	8,041	33.4	0.721***	0.762***
Average		**7,818**	**23.6**	**4,322**	**25.5**	**-**	**-**
Western Africa							
Benin	2001	6,219	15.2	2,465	20.7	3.354***	1.336*
Benin	2006	17,794	10.9	4,615	10.7	0.412***	0.404***
Benin	2011-12	16,599	18.9	4,433	25.8	1.666***	0.865**
Burkina Faso	2003	12,477	9.4	3,209	15.6	0.774***	0.605***
Burkina Faso	2010	17,087	11.6	6,500	17.9	0.283***	0.594***
Cote d'Ivoire	2011-12	10,060	23	4,636	26.3	2.528***	0.974
Gambia	2013	10,233	14.5	3,577	33.4	0.539***	0.782***
Ghana	2003	5,691	28.2	4,529	29.5	1.617***	0.909
Ghana	2008	4,916	35.4	4,058	37.1	0.838***	0.568***
Ghana	2014	9,396	64.1	3,869	63.7	2.493***	1.781***
Guinea	2005	7,954	3.9	2,709	14.3	0.163***	0.703***
Guinea	2012	9,142	16.3	-	-	2.258***	-
Liberia	2006-07	7,092	12.9	6,009	13.2	0.417***	0.838**
Liberia	2013	9,239	28.7	4,118	25.3	0.930**	0.351***
Mali	2001	12,849	6.4	3,000	9.8	1.287***	0.678**
Mali	2006	14,583	9.4	3,704	22.4	0.370***	1.307***

Table 3:
Female/Male Awareness of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N surveyed Women	% heard of Women	N surveyed Men	% heard of Men	Odds Ratios Women	Odds Ratios Men
Mali	2012-13	10,424	19	3,796	16.6	1.649***	0.452***
Niger	2006	9,223	3.4	3,101	16.8	0.217***	1.273***
Niger	2012	11,160	4.4	3,389	8.1	0.605***	0.285***
Nigeria	2003	7,620	15.7	2,093	29.2	0.864**	1.046
Nigeria	2008	33,385	15.4	13,808	25.5	0.284***	0.315***
Nigeria	2013	38,948	30.3	17,359	31.9	1.204***	0.645***
Senegal	2005	14,602	9.6	3,415	15.6	0.404***	0.676***
Senegal	2010-16	50,528	18	14,003	27.8	0.502***	0.482***
Sierra Leone	2008	7,374	6.2	2,944	13.7	0.147***	0.226***
Sierra Leone	2013	16,658	30.9	6,582	20.7	1.636***	0.412***
Togo	2013-14	9,480	37.7	4,018	37.7	1.776***	0.780***
Average		**14,101**	**18.5**	**5,228**	**23.4**	**-**	**-**
Asia							
Cambodia	2000	15,351	1.7	-	-	0.184***	-
Cambodia	2005+ 2010-11	35,577	7.3	-	-	0.211***	-
Cambodia	2014	17,578	16.4	-	-	0.375***	-
India	2005-06	124,385	10.8	69,751	20.3	0.296***	0.609***
India (ref)	2015-16	699,686	38.5	103,411	44.5	1.000	1.000
Indonesia*	2007	32,895	7.3	7,603	4.5	0.142***	0.190***
Indonesia*	2012	45,607	11	8,014	7.3	0.639***	0.095***
Kyrgyz Republic	2012	8,208	27.7	2,413	19.8	1.375***	0.256***
Maldives*	2009	7,131	26.6	1,388	33.9	0.715***	0.737**
Myanmar	2015-16	12,885	25.4	4,737	25.7	0.566***	0.549***
Nepal	2006	10,793	7.4	3,854	16.8	0.230***	0.525***
Nepal	2011	12,674	28.8	4,121	38.7	0.987	1.256***
Nepal	2016	12,862	35.8	4,063	55	0.617***	1.098***
Pakistan*.♦	2006-07	10,023	16.9	-	-	0.596***	-
Pakistan*.♦	2012-13	13,558	24.5	3,134	19.3	1.967***	0.395***
Philippines	2003	13,633	10.4	4,428	11.5	0.271***	0.207***
Philippines	2008	13,594	9.7	-	-	0.088***	-
Philippines	2013	16,155	14	-	-	0.208***	-
Tajikistan	2012	9,656	16.5	-	-	0.910**	-
Timor-Leste	2009-10	13,137	3.2	4,076	3.7	0.069***	0.069***
Timor-Leste	2016	12,607	13.3	4,075	17.7	0.206***	0.331***
Average		**54,190**	**16.8**	**16,076**	**22.8**	**-**	**-**

Table 3:
Female/Male Awareness of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N surveyed Women	% heard of Women	N surveyed Men	% heard of Men	Odds Ratios Women	Odds Ratios Men
Europe and West Asia							
Albania	2008-09	7,584	28.2	3,013	32.7	0.520***	0.693***
Armenia	2000 + 2005	12,996	15.6	1,447	20.7	0.408***	0.567***
Armenia	2010	5,922	26.8	1,584	30.4	0.258***	0.441***
Armenia	2015-16	6,116	40.1	2,755	46	0.459***	0.631***
Azerbaijan	2006	8,444	4.6	2,245	18.3	0.095***	0.317***
Jordan*.♦	2002	6,006	13.35	-	-	omitted	-
Jordan*.♦	2007 + 2009	20,985	14.71	-	-	0.229***	-
Jordan*.♦	2012	11,352	16.51	-	-	0.539***	-
Moldova	2005	7,440	38.1	1,989	-	1.102**	-
Turkey*.♦	2003-04	8,075	15.43	-	-	0.885**	-
Ukraine	2007	6,841	48.5	3,178	31.7	0.781***	1.538***
Yemen♦	2013	16,564	11.4	-	-	omitted	-
Average		**9,860**	**22.8**	**2,316**	**30.0**	**-**	**-**
Latin America and the Caribbean							
Bolivia	2003-04	17,654	15.2	5,327	16.9	0.605***	0.338***
Bolivia	2008	16,939	28.3	5,096	32.2	0.535***	0.343***
Colombia	2000 +2004-05	52,929	31.5	-	-	1.482***	-
Colombia	2009-10	53,521	68	-	-	1.626***	-
Colombia	2015-16	38,718	75.1	28,476	70.7	2.127***	1.695***
Dominican Republic	1999	1,286	27.1	913	26	2.917***	3.297***
Dominican Republic	2002	23,384	31.6	2,537	25.7	6.696***	1.436*
Dominican Republic	2007	27,195	45.3	-	-	2.213***	-
Dominican Republic	2013	9,372	76.4	-	-	9.414***	-
Guatemala	2014-15	25,914	34.3	9,866	43.7	1.056***	1.254***
Guyana	2009	4,996	29.7	3,522	26.6	0.474***	0.349***
Haiti	2000	10,159	10.6	2,809	11	1.136**	0.483***
Haiti	2005-06	10,757	13.2	-	-	0.439***	-
Haiti	2012	14,287	19.3	-	-	1.889***	-
Honduras	2005-06	19,948	34.9	-	-	1.307***	-
Honduras	2011-12	22,757	53.5	6,152	54.7	4.288***	2.365***
Nicaragua	2001	13,060	21.4	-	-	3.154***	-
Peru	2003-2008	83,296	59.1	-	-	2.066***	-
Peru	2009-2012	93,564	56.1	-	-	1.978***	-
Average		**28,407**	**38.5**	**7,189**	**34.2**	**-**	**-**
Total average		**21,557**	**19.7**	**6,625**	**25.6**	**-**	**-**

*: Sample includes ever-married women only. ♦: Not controlled for ever having sex; No data available.

Table 4:
Religion compositions for all analyzed countries.[24]

Country	Christians	Muslim	Hindu	Buddhist	Folk
Central Africa					
Angola	90.5	0.2	<0.1	<0.1	4.2
Cameroon	70.3	18.3	<0.1	<0.1	3.3
Chad	40.6	55.3	<0.1	<0.1	1.4
Congo	85.9	1.2	<0.1	<0.1	2.8
Congo Democratic Republic	95.8	1.5	<0.1	<0.1	0.7
Gabon	76.5	11.2	<0.1	<0.1	6
Sao Tome and Principe	82.2	<0.1	<0.1	<0.1	2.9
Eastern Africa					
Burundi	91.5	2.8	<0.1	<0.1	5.7
Comoros	0.5	98.3	<0.1	<0.1	1
Ethiopia	62.8	34.6	<0.1	<0.1	2.6
Kenya	84.8	9.7	<0.1	<0.1	1.7
Madagascar	85.3	3	<0.1	<0.1	4.5
Malawi	82.7	13	<0.1	<0.1	1.7
Mozambique	56.7	18	<0.1	<0.1	7.4
Rwanda	93.4	1.8	<0.1	<0.1	1
Tanzania	61.4	35.2	0.1	<0.1	1.8
Uganda	86.7	11.5	0.3	<0.1	0.9
Zambia	97.6	0.5	0.1	<0.1	0.3
Northern Africa					
Egypt	5.1	94.9	<0.1	<0.1	<0.1
Southern Africa					
Lesotho	96.8	<0.1	<0.1	<0.1	0.1
Namibia	97.5	0.3	<0.1	<0.1	0.2
Swaziland	88.1	0.2	0.1	<0.1	1
Zimbabwe	87	0.9	<0.1	<0.1	3.8
Western Africa					
Benin	53	23.8	<0.1	<0.1	18.1
Burkina Faso	22.5	61.6	<0.1	<0.1	15.4
Cote d'Ivoire	44.1	37.5	<0.1	<0.1	10.2
Gambia	4.5	95.1	<0.1	<0.1	0.1
Ghana	74.9	15.8	<0.1	<0.1	4.9
Guinea	10.9	84.4	<0.1	<0.1	2.7
Liberia	85.9	12	<0.1	<0.1	0.5
Mali	3.2	92.4	<0.1	<0.1	1.6

[24] Based on Pew Research Center's Forum on Religion & Public Life (2012), The Global Religious Landscape: A Report on the Size and Distribution of the World's Major Religious Groups as of 2010, Pew Research Center.

Table 4:
Religion compositions for all analyzed countries.[24]

Country	Christians	Muslim	Hindu	Buddhist	Folk
Niger	0.8	98.4	<0.1	<0.1	<0.1
Nigeria	49.3	48.8	<0.1	<0.1	1.4
Senegal	3.6	96.4	<0.1	<0.1	<0.1
Sierra Leone	20.9	78	<0.1	<0.1	0.8
Togo	43.7	14	<0.1	<0.1	35.6
Asia					
Cambodia	0.4	2.2	<0.1	96.9	0.6
India	2.5	14.4	79.5	0.8	0.5
Indonesia	9.9	87.2	1.7	0.7	0.3
Kyrgyz Republic	11.4	88	<0.1	<0.1	0.1
Maldives	0.4	98.4	0.3	0.6	<0.1
Myanmar	7.8	4	1.7	80.1	5.8
Nepal	0.5	4.6	80.7	10.3	3.7
Pakistan	1.6	96.4	1.9	<0.1	<0.1
Philippines	85	5.5	<0.1	<0.1	1.5
Tajikistan	1.6	96.7	<0.1	<0.1	<0.1
Timor-Leste	99.6	0.1	<0.1	<0.1	0.1
Europe and West Asia					
Albania	18.0	80.3	<0.1	<0.1	<0.1
Armenia	98.5	<0.1	<0.1	<0.1	<0.1
Azerbaijan	3	96.9	<0.1	<0.1	<0.1
Jordan	2.2	97.2	0.1	0.4	<0.1
Moldova	97.4	0.6	<0.1	<0.1	<0.1
Turkey	0.4	98	<0.1	<0.1	<0.1
Ukraine	83.8	1.2	<0.1	<0.1	<0.1
Yemen	0.2	99.1	0.6	<0.1	<0.1
Latin America and the Caribbean					
Bolivia	93.9	<0.1	<0.1	<0.1	0.9
Colombia	92.5	<0.1	<0.1	<0.1	0.8
Dominican Republic	88	<0.1	<0.1	<0.1	0.9
Guatemala	95.2	<0.1	<0.1	<0.1	0.6
Guyana	66	6.4	24.9	<0.1	0.2
Haiti	86.9	<0.1	<0.1	<0.1	2.2
Honduras	87.6	0.1	<0.1	<0.1	1.1
Nicaragua	85.8	<0.1	<0.1	<0.1	1.4
Peru	95.5	<0.1	<0.1	0.2	1

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10. Appendix on usage of emergency contraception

Empirical model

People all over the world should not only be aware of the existence of EC, but they should also know how to obtain it and how to safely use it. Furthermore, they should not mistake EC for an abortifacient. An analysis on the usage of EC is therefore executed, since this could be a better indicator for actual knowledge of EC and for the accessibility to it. However, it should be noted though that usage rates are supposed to be low, because EC is meant to be used only as an emergency measure.

The empirical analysis on the usage of EC is also a multivariate logistic regression model where the explanatory variables are reported as odds ratios. All 76 standard DHS survey datasets with data on ever usage of EC were pooled which allowed 51 countries to be analyzed. The timeframe ranges from 1999 when the variable ever usage became included into the DHS surveys until 2016 when the latest survey including the ever usage of EC was conducted. Respondents who were coded as being aware of EC where subsequently asked if they had ever used it. Regrettably, the DHS program decided to exclude the variable ever-usage from their most recent surveys (phase 7) which is the reason that the analysis is less extensive then the one on women's awareness.

Despite the dependent variable ever used EC, the model on usage is identical to the model for women's awareness. Therefore, the classification of the independent variables will not be discussed again. The only dissimilarity is that while the analysis on awareness included all respondents, this analysis only includes women who ever had sexual intercourse since usage is not relevant otherwise. The reference category for the surveys is India 2015-16 again, because of its huge sample size.

Individual and household characteristics

Table 1 of the appendix shows that the effect of all individual and household characteristics on the ever usage of EC. The results show that women from rural areas are significantly less likely to have ever used EC. The ever usage of EC displays a peak for age group 20-24 that is slightly higher than the reference category after which the ever usage solely declines with age. The ever usage of EC increases with education. Furthermore, the likelihood of women having ever used EC is almost half for married women compared to never married women and the same holds for women living together. Unfortunately, the results for formerly married women are insignificant. Never-married women were also the most likely to have heard about EC. It is reassuring that women with an unmet need seem to have higher chances of ever having used EC than women without unmet need. This was the other way around for awareness. Having heard of family planning in the past months does not seem to have a substantial effect on the usage of EC.

Global usage of EC over time

Interestingly, women's ever usage of EC also has a clear peak in 2008 after which the odds ratios decline just like awareness. However, where awareness of EC did increase over the years 1999-2017, the ever usage rates plunged after 2015 almost reaching zero. Unfortunately, the year 2013 is insignificant and there is no survey data from 2014 so it is hard to tell when this nosedive started. An explanation for the drop in odds ratios could be that the effects are muddled by the 2015/16 India survey which had a very low usage rate (0,2%) and a huge sample size.

Table 2 of the appendix shows the odds ratios for all individual surveys. Of the 16 countries that could be analyzed over time, 12 had undergone a decline which means

that in 75% of these countries the ever usage of EC has declined. This is surprising, since the percentages of women having ever used of EC all appeared to go up based on the DHS summary statistics.[25] Thus just like with awareness, the positive trend in ever usage of EC ceases to exist when taking individual characteristics, household characteristics, years and individual surveys into account.

Regions

Unfortunately, there are not enough observations over time to compare the regions on this front. Timor-Leste, Egypt, Sao Tome and Principe, Indonesia and Rwanda have the lowest ever usage odds ratios on average, but there are many other countries with extremely low results. Colombia, Congo, Gabon and Moldova have the highest likelihood of women having ever used EC on average.

[25] Minor exceptions: Benin (2006), Philippines (2008), Dominican Republic (2002).

Appendix Table 1:
Individual/household characteristics and years influencing the usage of EC.
Note: * p < 0,1; **p < 0,05; *** p < 0,01

Individual/household characteristics and years	N Sexually experienced Women	Odds Ratios
Place of residence		
Urban (ref)	656,636	1.000
Rural	937,469	0.726***
Age		
15-19 (ref)	110,071	1.000
20-24	260,088	1.086***
25-29	298,335	0.975
30-34	269,645	0.745***
35-39	250,694	0.542***
40-44	214,405	0.376***
45-49	190,191	0.259***
Education		
No education (ref)	426,726	1.000
incomplete primary	259,301	1.206***
complete primary	159,873	1.227***
incomplete secondary	394,502	1.581***
complete secondary	175,777	1.899***
higher	171,815	2.955***
Marital status		
Never married (ref)	110,192	1.000
married	1,138,032	0.536***
Formerly married	146,758	0.980
Living together	199,061	0.653***
Unmet need		
No unmet need (ref)	1,361,390	1.000
Unmet need	232,715	1.291***
Heard of FP last months (TV/radio/newspaper)		
Did not hear about FP in last months (ref)	717,238	1.000
Hear about FP in last months	876,867	1.033**

Appendix Table 1:
Individual/household characteristics and years influencing the usage of EC.
Note: * p < 0,1; **p < 0,05; *** p < 0,01

Individual/household characteristics and years	N Sexually experienced Women	Odds Ratios
Year		
1999	5,763	1.000
2000	66,623	1.252
2001	32,314	1.227
2002	30,472	0.309*
2003	56,588	1.674*
2004	62,363	1.653**
2005	128,846	1.689***
2006	192,924	1.650**
2007	113,609	2.892***
2008	116,317	3.909***
2009	71,744	2.277***
2010	80,092	2.612***
2011	26,537	3.350***
2012	39,685	3.797***
2013	3,662	1.738
2014	-	-
2015	303,081	0.037***
2016	263,485	0.050***

Appendix Table 2:
Ever usage of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N sexually experienced Women	% Ever used	Odds Ratios Women
Central Africa				
Cameroon	2004	9,334	2.6	1.169
Chad	2004	5,152	0.0	0.324***
Congo	2005	6,484	12.0	4.713***
Congo Democratic Rep.	2007	8,727	1.1	0.494***
Gabon	2000	5,691	3.2	1.752***
Sao Tome and Principe	2008-09	2,291	0.5	0.110***
Average		**6,280**	**3.2**	**-**
Eastern Africa				
Kenya	2003	6,797	0.9	0.322***
Kenya	2008-09	7,037	1.7	0.237***
Madagascar	2003-04	6,998	0.3	0.622***
Madagascar	2008-09	15,322	0.5	0.295***
Malawi	2000 + 2004-05	22,316	0.4	0.200***
Malawi	2010	19,88	0.7	0.147***
Rwanda	2000 + 2005	15,014	0.1	0.132***
Tanzania	2004-05	8,644	0.2	0.283***
Uganda	2000-01	6,339	0.2	0.247***
Uganda	2006	7,243	0.3	0.190***
Zambia	2001-02	6,784	0.3	0.837
Zambia	2007	6,214	0.5	0.211***
Average		**9,883**	**0.5**	**-**
Northern Africa				
Egypt*.♦	2005	19,474	0.1	0.154***
Egypt*.♦	2008	16,527	0.1	0.074***
Average		**18,001**	**0.1**	**-**
Southern Africa				
Lesotho	2004-05	5,892	0.4	0.353***
Namibia	2000	5,897	0.9	0.428***
Namibia	2006-07	8,294	1.6	0.392***
Swaziland	2006-07	4,117	2.6	0.634***
Zimbabwe	1999	4,749	0.6	omitted
Zimbabwe	2005-06	7,042	1.5	omitted
Average		**5,999**	**1.3**	**-**

Appendix Table 2:
Ever usage of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N sexually experienced Women	% Ever used	Odds Ratios Women
Western Africa				
Benin	2001	5,608	1.5	1.343
Benin	2006	16,033	0.9	0.832
Burkina Faso	2003	10,846	0.4	0.409***
Ghana	2003	4,836	1.1	0.357***
Ghana	2008	4,144	2.9	0.268***
Guinea	2005	7,18	0.2	0.599*
Liberia	2006-07	6,739	3.1	1.258
Mali	2001	11,827	0.2	0.718
Mali	2006	13,015	0.2	0.324***
Niger	2006	7,957	0.1	0.487**
Nigeria	2003	6,362	2.8	1.505*
Nigeria	2008	28,802	2.8	0.632***
Senegal	2005	10,954	0.2	0.218***
Sierra Leone	2008	6,863	1.1	0.696**
Average		**10,307**	**1.3**	**-**
Total average Africa		**9,273**	**1.3**	**-**
Asia				
Cambodia	2000	10,72	0.0	0.400*
Cambodia	2005-06	11,653	0.1	0.335***
India	2005-06	93,993	0.2	0.190***
India (ref)	2015-16	534,221	0.2	1.000***
Indonesia*	2007	32,881	0.3	0.130***
Maldives*	2009	7,129	0.6	0.166***
Nepal	2006	8,642	0.1	0.174***
Pakistan*.♦	2006-07	10,023	0.9	0.488***
Pakistan*.♦	2012-13	13,558	0.9	0.202***
Philippines	2003	9,552	0.4	0.434***
Philippines	2008	9,625	0.3	0.122***
Timor-Leste	2009-10	8,471	0.0	0.025***
Average		**67,250**	**0.3**	**-**

Appendix Table 2:
Ever usage of EC and Odds Ratios for all available DHS surveys.
Note: * p < 0.1; **p < 0.05; *** p < 0.01

Country	Year survey	N sexually experienced Women	% Ever used	Odds Ratios Women
Europe and West Asia				
Albania	2008-09	5,504	2.4	0.657***
Armenia	2000 + 2005	9,221	0.7	0.326***
Azerbaijan	2006	5,811	0.4	0.892
Jordan*.♦	2002	6,006	0.1	Omitted
Jordan*.♦	2007 + 2009	20,985	0.8	0.183***
Moldova	2005	6,039	3.0	0.761**
Turkey*.♦	2003-04	8,075	0.6	0.322***
Ukraine	2007	5,863	4.9	0.325***
Average		**8,438**	**1.6**	**-**
Latin America and the Caribbean				
Bolivia	2003-04	13,957	0.6	0.263***
Bolivia	2008	13,623	1.6	0.141***
Colombia	2000 +2004-05	42,535	2.1	0.453***
Colombia	2009-10	44,249	10.8	0.709**
Colombia	2015-16	32,345	19.9	87.090***
Dominican Republic	1999	1,014	0.8	0.409**
Dominican Republic	2002	19,131	0.7	0.998
Dominican Republic	2007	22,54	2.7	0.260***
Guyana	2009	4,244	1.6	0.317***
Haiti	2000	7,89	0.2	0.164***
Haiti	2005-06	8,55	0.3	0.160***
Honduras	2005-06	15,447	1.2	0.306***
Honduras	2011-12	18,25	5.0	0.409***
Nicaragua	2001	10,224	1.2	0.599
Peru	2003-2008	66,25	3.1	0.201***
Peru	2009-2012	76,459	10.8	0.628***
Average		**24,839**	**3.9**	**-**
Total average		**21,071**	**1.7**	**-**

***:** Sample includes ever-married women only. **♦:** No data available on ever having sex; N includes all ever-married women.