

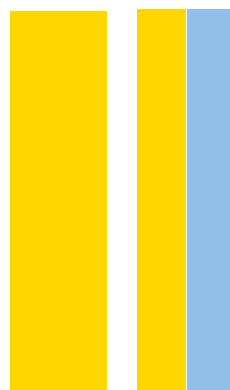
**MESTRADO**  
SAÚDE PÚBLICA

***Implementation of the project relevant to "Migrants'  
Perinatal Health" in Portugal: Dilemmas faced from  
the theory to the practice***

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**M**

**2018**



# ***Implementation of the project relevant to "Migrants' Perinatal Health" in Portugal: Dilemmas faced from the theory to the practice***

*Dissertação de candidatura ao grau de Mestre em Saúde Pública, apresentada à Faculdade de Medicina da Universidade do Porto e ao Instituto de Ciências Biomédicas Abel Salazar da Universidade do Porto*

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**Porto, 12/09/2018**  
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## Agradecimientos

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Na realização da presente dissertação, tive o apoio contínuo de inúmeras pessoas as quais estou agradecida.

A, Professor Doutor Henrique Barros, Director do Serviço de Epidemiologia da Faculdade de Medicina da Universidade do Porto e Presidente do Instituto de Saúde Pública da Universidade do Porto, pela oportunidade de integrar num projeto d'investigação, no qual adquiri competências a nível profissional e pessoal.

Desejo agradecer de maneira notável à minha orientadora, Professora Maria Cristina Martins Teixeira, que nunca abdicou de um trabalho exigente e construtivo, integrando um processo de evolução em termos competências, orientando de forma exemplar e incansável este trabalho de mestrado.

Um agradecimento especial para as minhas colegas de trabalho, Mestre Anna Muralova e Mestre Sousan Al Hamwi, pelo o apoio incondicional que me deixa sem palavras, por terem compartilhado os seus conhecimentos profissionais, pelo o tempo que disponibilizaram. Também um agradecimento a Mestre Sofia Lopes pela contribuição e a partilha de conhecimento.

Um agradecimento incondicional aos meus pais pela educação, apoio e a possibilidade que me deram de progredir nos estudos, sem eles esta caminhada não teria sido possível e desejo poder retribuir o amor incondicional que eles me demonstraram. E claro ao meu irmão agradeço por ter sido mais do que um amigo, por me ter acompanhado durante este trabalho sem nunca me deixar desistir, contribuindo de formas múltiplas a realização desta dissertação.

E por fim agradeço a todos os meus amigos e todas as pessoas que contribuíram para o progresso e realização deste trabalho.

# Index

1.) <u>Introduction</u>	
1.1 Definition of International migration.....	8
1.2 Data on International Migration.....	8-9
1.3 Portuguese Context.....	9-12
1.4 Vulnerability of migrants: International approach to migrants.....	13
1.5 Integration process of migrants at Portugal.....	14
1.6 International Human Rights: Health and migration, a sensitive topic.....	15-16
1.7 Challenges related to migrant women across Portugal.....	17
1.8 An emergent research in Portugal: Migrants and Perinatal Health: Barriers, Incentives and Outcomes – the baMBINO Project.....	17-20
1.9 The Challenges in implementing a nationwide research project.....	21-22
2.) <u>Aims</u> .....	23-24
3.) <u>Chapters</u> .....	25
3.1) Challenges in the implementation of a national survey to assess perinatal health among migrant women.....	26
3.1.1) Abstract.....	27
3.1.2) Introduction.....	28-30
3.1.3) Methods.....	30-31
3.1.3.1) Statistical Analysis.....	31
3.1.4) Results .....	31-33
3.1.4.1) Time-delay in implementing a recruitment process.....	31-32

3.1.4.2) Recruitment process in the maternity units.....	32
3.1.4.3) Interview 3 months after delivery (CATI).....	32-33
3.1.5) Discussion.....	33- 37
3.1.6) References.....	38-39
4.) <u>Conclusion</u> .....	54-55
5.) <u>References</u> .....	56-61
6.) <u>Annexes</u> .....	62-70

## List of figures

### **1.) Introduction**

#### **Figure 1:**

International migrant stock from 1990 to 2017. *Source:* The International Migration Report, United Nations, Department of Economic and Social Affairs, Population Division (2015;2017).....9

#### **Figure 2:**

Migrants groups across Portugal in 2017. *Source:* Ribeiro M.J., Estrela J., Machado R., Relatório de Imigração, Fronteiras e Asilo 2017. SEF 2018. 2017.....10

#### **Figure 3:**

Proportion of migrant women who applied for resident status in Portugal: 2016. *Source:* Instituto Nacional De Estatística., População estrangeira que solicitou estatuto de residente (N.º) por Local de residência (NUTS - 2013), Sexo e Nacionalidade; Anual, 2016.....12

### **2.) Chapters**

#### **Figure 1:**

Flowchart of the invited women in the maternity units of the public hospitals in Portugal and of the events resulting from the phone contacts by the interviewers.....41



## List of tables

### 1.) Introduction

#### **Table 1:**

Geographic distribution of migrants across Portugal in 2017 and variation of migrant stock over time. Source: Ribeiro M.J., Estrela J., Machado R., Relatório de Imigração, Fronteiras e Asilo 2017.SEF 2018.....11

#### **Table 2:**

Contents of the MFMCQ, EPDS and BQ. Source: 1) the **MFMCQ**: Gagnon AJ, DeBruyn R, Essén B, Gissler M, Heaman M, Jeambey Z, et al. 2014.; 2) the **EPDS**: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. K. L. Wisner, B. L. Parry, C. M. Piontek. 2002. and for 3) the **BQ** which was created to integrate the baMBINO project .....19-20

### 3.) Chapters

#### **Table 3:**

Identified languages in the project baMBINO with the types of translator used until July 2018......42

#### **Table 4:**

Socio-demographic characteristics of women who accepted to participate in the maternity units and those with results from the phone contacts until 25<sup>th</sup> July 2018......43-44

#### **Table 5:**

Explicative model of the women which initiated the interview until 25<sup>th</sup> July 2018......45

#### **Table 6:**

Mean number of phone contacts among all women with completed interview until 25<sup>th</sup> July 2018......46

### **3.1) Supplementary Material**

**Table 1:**

Waiting time between the submission of baMBINO project to the EC of the hospitals and the beginning of the recruitment .....48-50

**Table 2:**

Expected number of deliveries per week by hospital (only hospitals which accepted to participate).....51-53

### **6.) Annexes**

**Table 1:**

Classification of the maternal country of birth Source adapted from: World Bank Country,2018.....63-68

**Table 2:**

Hospitals being part of the project accorded to the regions of Portugal until 25<sup>th</sup> July 2018.....69-70

## Abbreviations

ACIME: High Commissioner for Immigration and Ethnic Minorities

BQ: Breastfeeding Questionnaire

CATI: Computer-Assisted Telephone Interview

CI: Confidence Interval

EC: Ethics Committee

EPDS: Edinburgh Depression Scale

OR: Odds Ratio

ROAM: Reproductive Outcomes and Migration

UN: United Nations

UNFPA: United Nations Population Fund

ICESCR: International Covenant on Economic, Social and Cultural Rights

IHR: International Human Rights

IM: International Migration

IOM: International Organization for Migration

MFMCQ: Migrant Friendly Maternity Care Questionnaire

OHCHR: Office of the High Commissioner of Human Rights

SEF: Serviço de Estrangeiros e Fronteiras

WHO: World Health Organization

## Resumo

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**Introdução:** A migração é um fenómeno crescente a nível mundial, atingindo 258 milhões de indivíduos em 2017. Em Portugal, no referido ano, mais de metade das mulheres migrantes residentes (51,2%) estavam em idade ativa no mercado de trabalho, idade que se sobrepõe em grande parte com a idade reprodutiva. No entanto, as mulheres migrantes são grupos considerados vulneráveis, enfrentando vários desafios no acesso aos serviços de saúde, devido, por exemplo, as barreiras linguísticas ou situação legal. Têm sido observadas disparidades entre migrantes e nativas não só na utilização dos cuidados pré-natais, mas também na saúde perinatal, com maior frequência de resultados adversos em migrantes. Para fornecer conhecimento baseado na evidência, foi desenvolvido um projeto de âmbito nacional, “Saúde Perinatal em Migrantes: Barreiras Incentivos e Resultados (projeto ”baMBINO) com o objetivo de perceber o uso dos e o acesso aos serviços de saúde durante a gravidez, parto e período pós-parto e como estes mesmos influenciam as disparidades nos resultados relacionados com a saúde perinatal entre mulheres migrantes e nativas. No entanto, o envolvimento na investigação de todos os hospitais públicos e de mulheres migrantes pode aumentar os desafios no processo de implementação. O principal objetivo deste estudo foi o de precisamente identificar os referidos desafios no processo de implementação deste projecto.

**Métodos:** Os dados para este estudo foram obtidos do processo de implementação do projeto baMBINO que é de âmbito nacional e envolve mulheres migrantes e nativas recrutadas durante o internamento por parto nos hospitais públicos portugueses. O recrutamento calculado para decorrer durante 9 meses prevê que para cada migrante recrutada seja recrutada também uma mulher nativa com o intuito de obter uma amostra 7000 participantes das quais 3500 seriam migrantes. De acordo com o desenho do estudo o recrutamento seria responsabilidade de pontos focais nas maternidades e 3 meses após o parto, as participantes seriam contactadas por um elemento da equipa baMBINO para conduzir uma entrevista telefónica com suporte informático (CATI). Tendo em conta as várias etapas no processo de implementação. Para avaliar o processo de recrutamento nos hospitais calculou-se: (1) o tempo de espera desde o primeiro contacto com os hospitais e o início de recrutamento em cada hospital, (2) a diferença entre o número real e número esperado de mulheres recrutadas por semana em cada hospital. Para avaliar a recolha de informação por CATI, foi obtida informação sobre o número de contactos telefónicos necessários para obter cada entrevista completa e o número de diferentes línguas identificadas no contacto telefónico com migrantes. As participantes foram classificadas em três grupos de acordo com o resultado de contacto telefónico: as que iniciaram a entrevista, as que não têm número de telefone ou nunca responderam aos contactos e as que recusaram a CATI. Estes grupos foram comparados para variáveis sociodemográficas.

Através de modelo de regressão logística multivariada foi avaliada a associação entre variáveis sociodemográficas e o resultado de contacto telefónico dicotomizado em iniciou CATI e não iniciou CATI, tendo sido obtido odds ratio (OR) ajustado e respetivo intervalo de confiança a 95% (IC 95%).

**Resultados:** Dos hospitais convidados 33 aceitaram participar no projecto. O tempo médio de espera entre o primeiro contato com os hospitais e o início do recrutamento foi de 4,1 ( $\pm$  2,54) meses. O número de pontos focais variou entre 1 a 6, sendo na sua maioria obstetras. Observou-se uma grande diferença entre o número real ( $n = 90$ ) e o esperado ( $n = 230$ ) de mulheres recrutadas por semana pelos pontos focais. Relativamente ao CATI, de 4929 participantes, 3% recusaram e 31% não tinham número de telefone ou o contato telefónico foi infrutífero. Houve diferenças significativas entre as participantes de acordo com o resultado do contacto telefónico: por cada ano de idade materna, aumentou 5% a probabilidade de iniciar o CATI (OR=1.05; IC95%: 1.04, 1.07). Mulheres do Leste Europeu e Ásia Central têm 47% mais probabilidade de iniciar a CATI (OR=1.47; IC95%: 1.09, 2.00) do que as nativas, participantes recrutadas em Lisboa e Vale do Tejo têm menor probabilidade de iniciar CATI (OR=0.49; IC95%: 0.40, 0.59) em comparação com as recrutadas no Norte e as múltiparas apresentam menor probabilidade (OR=0.66; IC95%: 0.57, 0.76) que as primíparas de iniciar a CATI. Foram identificados 22 idiomas diferentes.

**Conclusão:** Este estudo mostrou que os atrasos no processo de implementação precisam de ser considerados durante o planeamento do cronograma de futura investigação. Embora o uso de CATI na recolha de dados apresente vantagens há que ter em conta os contactos telefónicos omissos ou sem sucesso que têm impacto negativo neste processo.

**Palavras-chave:** *Mulheres, Migrantes, Saúde Perinatal, Processo de Implementação de Projecto de Investigação*

## Abstract

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**Introduction:** Migration is an increasing phenomenon worldwide, attaining 258 million in 2017. In Portugal in the year 2017, more than half of the resident, migrant women (51.2%) were in working age. However, migrant women are considerate vulnerable groups, facing several challenges in the access of health care services due for instance to language barriers or legal status. Disparities of migrants compared to native women have been observed in the use of prenatal care and perinatal health with adverse outcomes in regards to migrants. To provide evidence-based knowledge, the project baMBINO has been developed which aims to perceive the use of and the access of healthcare services during pregnancy, birth and post-partum period and how they influence disparities in perinatal outcomes between migrant and native women. Nevertheless, the involvement of all public hospitals and migrant women in research might rise challenges in the implementation process. The main goal of this study was to identify challenges in the implementation process of the baMBINO project.

**Methods:** Descriptive data for this study were obtained from the project baMBINO which is national research involving migrant and native women during their staying for childbirth in Portuguese public hospitals. The recruitment was planned to occur during 9 months, for each migrant woman recruited, a native woman should be recruited obtaining a sample of 7000 participants, from which 3500 would be migrant women. According to the study design, focal points in each maternity unit would be responsible for the recruitment. Moreover, 3 months after delivery, participants would be contacted by a member of the baMBINO team to conduct a computer-assisted telephone interview (CATI). Taking into account the various steps in the implementation process. In order to evaluate the hospital recruitment process, it was computed: (1) the waiting time from the first contact with the hospitals and the beginning of recruitment in each hospital, (2) the difference between the real number and the expected number of women recruited per week in each hospital. In order to evaluate data collected by CATI, information was obtained on the number of phone contacts needed to obtain each complete interview and on the number of different languages identified in the phone contacts with migrants. The participants were classified into three groups according to the outcome of phone contact: those who started the interview, those who didn't have a phone number or unsuccessful phone contact attempts and those who refused CATI. These groups were compared in regards to socio-demographic variables. A multivariate logistic regression model was used to evaluate the association between socio-demographic variables and the outcomes of phone contact dichotomized in initiated CATI and non-initiated CATI obtaining the adjusted odds ratio (OR) and 95% confidence interval (CI 95%).



**Results:** From the invited hospitals 33 accepted to participate in the project. The average waiting time between the first contact with the hospitals and the beginning of the recruitment was 4.1 ( $\pm$  2.54) months. The number of focal points varied from 1 to 6, being mostly obstetricians. A large difference was observed between the real (n = 90) and expected (n = 230) number of recruited women per week by the focal points. Regarding CATI, from 4929 participants, 3% refused, and 31% didn't have a phone number or unsuccessful phone contacts. There were significant differences among the participants according to the outcomes of phone contact: for each year of maternal age, the likeliness to initiate CATI (OR = 1.05, 95% CI 1.04, 1.07) increased by 5%. Women from Eastern Europe and Central Asia are 47% more likely to initiate CATI (OR = 1.47, 95% CI: 1.09, 2.00) than native women. Participants recruited in Lisboa e Vale do Tejo are less likely to initiate CATI (OR = 0.49, 95% CI: 0.40, 0.59) compared to those recruited in the North, and multiparous women were less likely (OR = 0.66, 95% CI: 0.57, 0.76) than primiparous women to initiate CATI. Furthermore, 22 different languages have been identified.

**Conclusion:** This study showed that delays in the implementation process need to be considered during the planning of the timeline of future research. Although the use of CATI in data collection has advantages, it is important to take in count missing phone contacts or unsuccessful phone contacts which have a negative impact on the implementation process.

**Keywords:** *Women, Migrants, Perinatal Care, Implementation process of a research project*

## 1.) Introduction

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## 1.1 Definition of International migration

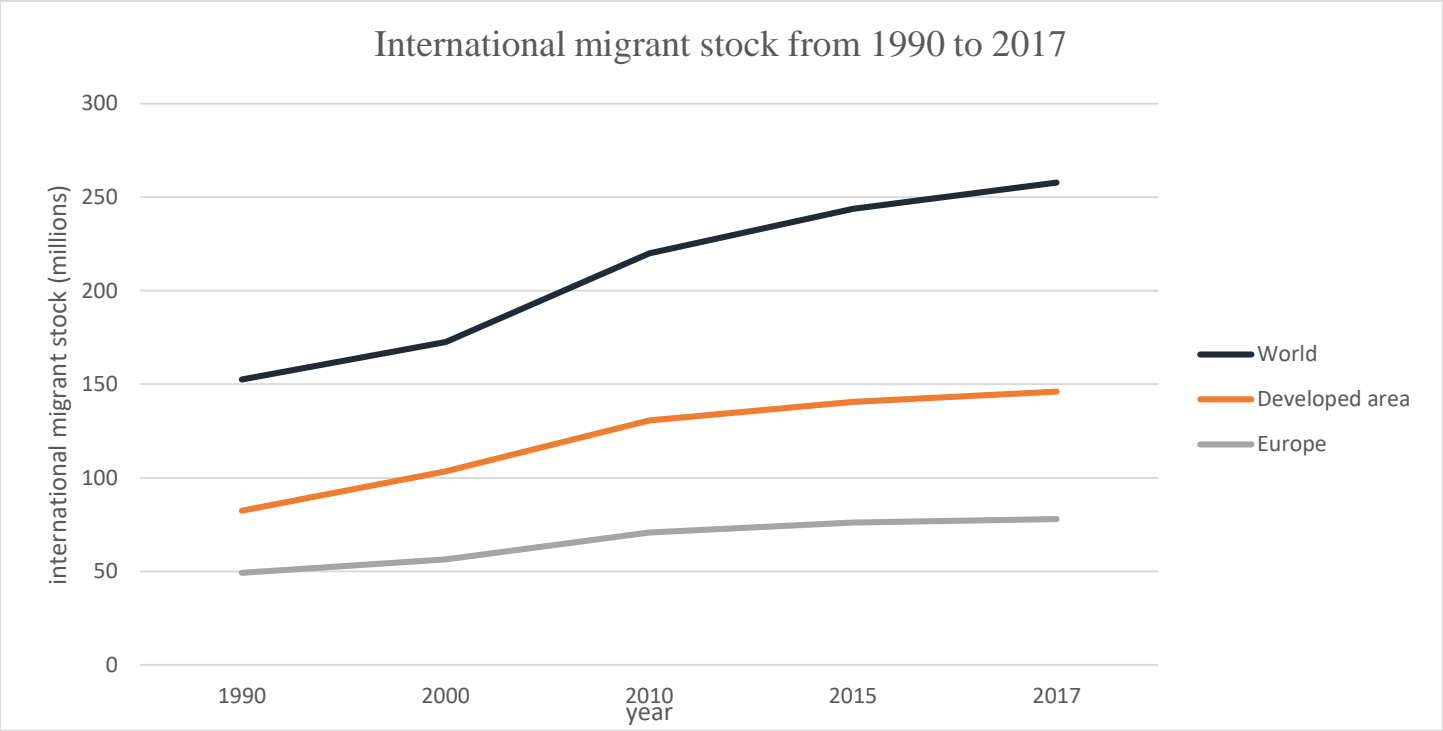
In 1998, the United Nations (UN) argued the necessity to improve statistics on international migrants (IM), and the need for a consistent definition across countries for IM. According to the UN, an international migrant is "*any person who changes his or her country of usual residence.*" Several situations were excluded such as traveling for work or holidays. However, some doubts around the term of "*usual residence*" could appear. For instance, for persons that left their residence to live in an alternative country but having as the only purpose to study in the host country, or for workers living near the workplace and returning each week at home. In such cases, the UN recommend taking into count the time-period in which a person remains in a place. The term "*usual residence*" is related not only to the *place* but also to the *time*. Following both criteria', it is possible to distinguish a tourist from a migrant. In this sense, a distinction is made between "*short and long-term international migrant.*" A "*short-term international migrant*" is a person who left the country of origin to live in another country at least *three months but not exceeding 12 months*, including the exceptions mentioned above. A "*long-term international migrant*" is designed by living in another country as the one of origin by at least twelve months (1).

## 1.2 Data on International Migration

The dimension of the migration worldwide might be evaluated through the stock of IM. Statistics concerning migration would allow to compare and to observe different trends related to the human movement between the diverse areas in the world (2) and they reflect globally the different level of involvement and challenges faced by the host countries (3). However, some pitfalls have been spotlighted in gathering information about migration time-trends. Firstly, data on IM do not provide a real dimension of human movements across countries. Secondly, although the revision of the UN recommendations on IM statistics undertaken in the nineties, the lack of comparability across countries remains nowadays (4).

According to the "*International Migration Report 2017,*" the number or "stock" of IM worldwide has increased over the last decade reaching 258 million in 2017 up from 173 million in 2000 (5, 6) (**Figure 1**). High-income countries host 64% of migrant people (165 million), and one-third of IM lives in Europe. Of the 258 million IM worldwide, 106 million were born in Asia, 61 million in Europe, 38 million in Latin America and the Caribbean and 38 million in Africa (6). Women correspond to almost 50% of all IM worldwide, but the proportion of migrant women varies across geographic regions (5, 6). In Europe, the proportion of female among migrants increased from 51.6% in 2000 to 52.0% in 2017 (6). Worldwide 74.0% of all IM are aged 20 to 64 years which are the commonly working ages but only 57%

of the native population belong to these age groups. Notice also that in 2017, the percentage of women among migrants in working age is higher in developed areas (51.2%) than in developing areas (41.6%) (5).

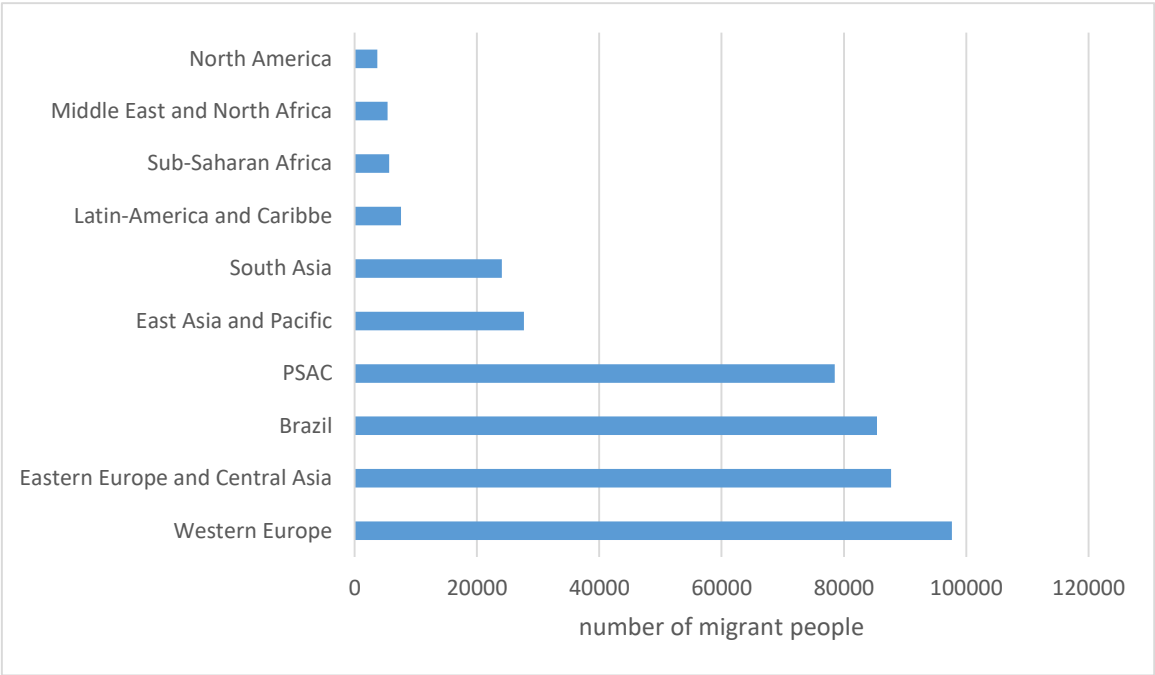


**Figure 1:** International migrant stock from 1990 to 2017. *Source:* The International Migration Report, United Nations, Department of Economic and Social Affairs, Population Division (2015;2017).

1.3 Portuguese Context

In 2017 there were 421 711 migrants with a resident status living in Portugal (7). However, the origin of these migrants is the result of a continuous migration process that Portugal witnessed over time. Over the years 70's Portugal was confronted with a dramatic increase in immigrant people, due to the decolonization of the Portuguese-speaking African countries (PSAC). This situation brought a large number of African migrants from Angola, Cabo Verde, San Tome and Principe, Mozambique, and Guinea-Bissau, most of them living at Lisbon. Still, the past colonial tie in Brazil brought also many Brazilian migrants to Portugal. Nevertheless, the shape of migration changed over the time, as a consequence of demands of the labor market and the adhesion of Portugal to the European Union Notice that in the 90's, a flow of *undocumented immigrants* arriving in Portugal came from countries such

as Ukraine, Russia, Moldova, and Romania (8), rising challenges to Portuguese policy-makers in regards to diversity of cultural background. Within the historical human movement, Portugal is nowadays confronted with a heterogeneous group of migrants; as demonstrated in **Figure 2**. However, more than one third of migrant people with a residence in Portugal came from PSAC and Brazil (n=163·923; 39%) (7). Therefore, they share the same language and some cultural traits with the host population.



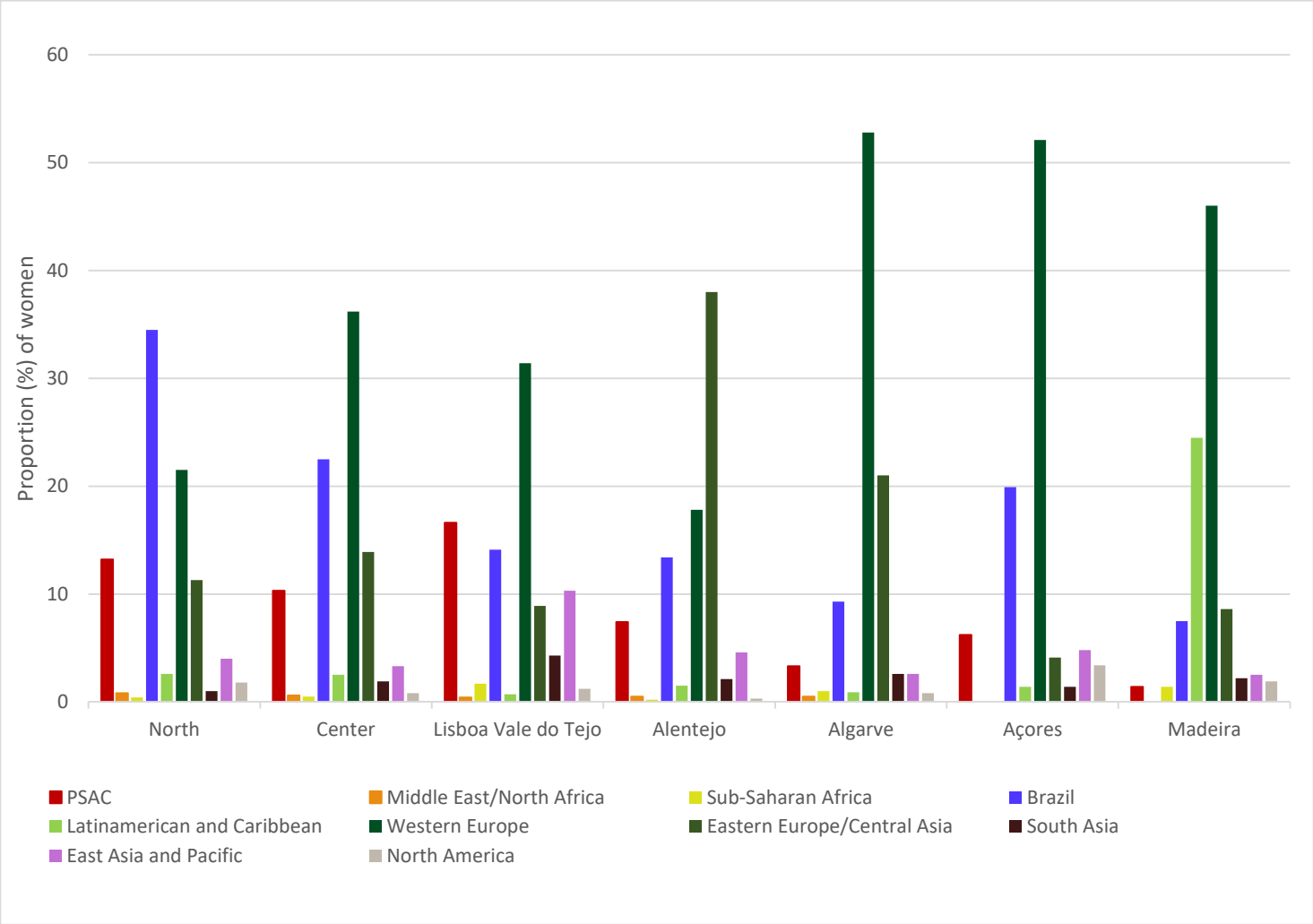
**Figure 2:** Migrants groups across Portugal in 2017. *Source:* Serviço de Estrangeiros e Fronteiras. R., Relatório de Imigração, Fronteiras e Asilo 2017. SEF 2018.

As shown in **Table 1**, in 2017, a predominance of migrant people (68.0%) was observed in the coastal area of Portugal particularly in Lisbon (n=182·105), Faro (n=69·026) and Setúbal (n=35·907). However, opposite to decades ago, when migrant people in Portugal lived exclusively in the coastal land of Portugal, nowadays they are migrant people in all Portuguese regions (7).

**Table 1: Geographic distribution of migrants across Portugal in 2017 and variation of migrant stock over time.** *Source: Serviço de Estrangeiros e Fronteiras. Relatório de Imigração, Fronteiras e Asilo 2017. SEF 2018.*

Regions	Number of migrant people	Variation (%) between the years 2016 and 2017
Açores	3476	+3.1
Aveiro	12487	+5.8
Beja	8497	+11.5
Braga	11322	+10.4
Bragança	3038	+13.1
Castelo Branco	4040	+10.9
Coimbra	12344	+3.7
Viana de Castelo	3158	+3.7
Vila Real	2067	+6.7
Viseu	3964	+0.1
Évora	4037	+3.9
Guarda	2025	+9.8
Leiria	16487	+5.8
Lisboa	182105	+5.2
Portalegre	2475	-0.6
Santarém	11068	+0.5
Setúbal	35907	-0.7
Faro	69026	+8.7
Madeira	6720	+10.0
Porto	27486	+14.1

Out of 421·711 migrants with a residence, living in Portugal in 2017, 176·028 (81.6%) are at working age, spotlighting that most of these migrants were aged between 20-39 years. Women contributed to more than half (51.2%) of the migrant people at working age (7), and the majority of these women are also at childbearing age. In 2017, out of 86·154 livebirths reported in Portugal, 8·316 (10.3%) were born to migrant women but this proportion varied across Portuguese regions from 1.5% in Açores to 18.6% in Algarve (9). In 2016, a large heterogeneity between Portuguese regions in regards to the country of origin of migrant women who applied for resident status in Portugal has been observed, such that predominant groups who applied to a resident status were women from PSAC in Lisboa e Vale do Tejo, Brazilian women in Norte and women from Eastern Europe and Central Asia in Algarve and Açores (10) (Figure 3).



**Figure 3:** Proportion of migrant women who applied for resident status in Portugal: 2016.

Source: Instituto Nacional De Estatística., População estrangeira que solicitou estatuto de residente (N.º) por Local de residência (NUTS - 2013), Sexo e Nacionalidade; Anual, 2016.

#### 1.4 Vulnerability of migrants: International approach to migrants

The increasing of human movement is the result of several combinations. On the one hand, the possibility and the accessibility to move from one country to another has increased in the last years, and it might not be seen as a barrier (6, 11). On the other hand, several circumstances such as conflict (2, 6, 11, 12), environmental events (e.g., tsunami, earthquakes) (11, 12), poverty (6) and lack of job (6, 12). Hampering access to essential services, such as health or education persuade people to leave their countries in hope to improve their live, as well as their family live (2, 6, 11, 12).

Migrants are a vulnerable group as they face a new environmental context including language, culture, legislation and healthcare system (11, 13, 14). Migrants are also more prone to suffer due to the non-respect of their human rights increasing their vulnerability. Indeed migrant people are more likely to work under worse conditions or being the first losing their labor in several circumstances such as economic crisis (6). As a result of their vulnerability, they might be exposed to violence, exploitation, and discrimination, in the host country (6, 11, 12). All of these conditions and events have a significant impact on public health (11, 12). Strategies to avoid these adverse circumstances and to increase the respect of human rights among migrant people has been adopted in 2016 through *New York Declaration for Refugees and Migrants* and signed by affiliate countries. The main goal of this declaration has been the increase in equity regarding the treatment of refugees and other migrant groups (6).

Migration has been increasingly recognized as a public high-priority issue by many governments who have developed efforts to overcome vulnerabilities of migrants. According to the "2030 Agenda for Sustainable Development," the standard issue of all countries is the empowerment of vulnerable people. Those whose needs are reflected in the Agenda include internally displaced persons, migrants, and refugees (15). International collaboration should guarantee to migrants, respectful human treatment and the safeguard of their human rights, including the right to health, regardless of their legal status, or their country of origin, or reasons that compel their movement from one country to another country (11,15). Concerned by the phenomena of migrants, the United Nations Population Fund (UNFPA) has been recognized the particular demands emerging from most vulnerable migrant groups as migrant women since that the majority of them are at the childbearing age (16).



## 1.5 Integration process of migrants at Portugal

Different authority's level, within the country, adopted several measures to respond to the human influx. For instance, the foundation of the High Commissioner for Immigration and Ethnic Minorities (ACIME) and the Consultative Council for Immigration Affairs, in the year 1996 and 1998, respectively. Or either in local levels the integration of intercultural scholarship programs (8). These measures would allow migrants to be appropriately integrated into the society and to have support towards to the regularization of documents. In 2001 the Portuguese legislation established the universal coverage on health without distinction based on migrant status or legal situation. However, migrant people need to comply with the condition to stay in the country at least ninety days, and this circumstance rises some questions among undocumented migrants (17). Nevertheless, emergency care cannot be refused. When migrant people fulfill the condition to have access to national healthcare services, they pay the fee for healthcare services as a native. Still, as native people, migrants could apply for fee exemption due to a poor socioeconomic status. No distinction is made between asylum seekers and natives regarding the access of healthcare services (18).

In 2002 the ACIME settled a program promoting the integration of migrants based on few matters such as labor, health, and education. ACIME and the ministry of health had as target objectives to endorse access on migrant-friendly health centers and hospitals, to arise comprehension about the modalities of the health care services to migrants and to establish an Immigration Observatory (17). Already, in 2003, hospitals in Europe have identified some barriers hampering health care to migrants. Such barriers include cultural disparities, the absence of accurate information, linguistic barriers and the lack of reporting about these issues (19). Following these thoughts, a "national plan for immigrant integration" has been elaborated in 2007 (17, 20), and revised in 2010 (21). A "strategic plan for migration" has also been settled in 2015 (22).

The integration of migrants into the Portuguese society has been improved considering the actual state of the phenomenon. The national plan of 2010, included 17 areas of interventions with 90 measures. Health is a part of this plan and include six measures, all of them focused on the decrease of inequities in health between migrant groups and native people. In order to achieve this aim, it is important to promote access to healthcare services and to prepare health professionals to receive immigrants (21). The Gulbenkian foundation spotlighted the importance of integration and collaboration between the health professional, society, government and others stakeholders to achieve an improvement of the national health system in Portugal (23).

## 1.6 International Human Rights: Health and migration, a sensitive topic

The increasing of migrants has risen several concerns on the safeguard of human rights. Health has been recognized as an international right, for instance, the article 12 from the International Covenant on Economic, Social and Cultural Rights (ICESCR) dispose that "States Parties to the present Covenant recognize the right of everyone to the enjoyment of the highest attainable standard of physical and mental health (11, 14) ".

Seeing the essence of those aspects, the International Organization for Migration (IOM) stated that this right should also be provided to migrant people. Improving physical, mental and social elements, would be beneficial to the migrant and the native groups, since that they will be able to contribute positively in achieving social and economic development (2, 11). Migrants' health is a sensitive topic. Inequity on access to health among migrant people has been reported and such inequity might be due to structural difficulties, to the lack of knowledge of the health system, to administrative adversity (24), language barriers, to cultural characteristics (11, 18), to migrant's status and economic or social obstacles (16). Disparities in health have been reported between migrants and natives (18, 25, 26). As the number of migrants increases, also increase the number of challenges in regards to migrant health. As a result, in the "*Global Consultation on the Health of Migrants*," the IOM, the World Health Organization (WHO) and the Government of Spain decided to put in place several mainstays towards migration health. Such mainstays include migrant health control, a friendly health system for migrants, promoting collaboration between countries and support of contributive laws to migrant health. In the "*Global Consultation on the Health of Migrants*" four methods have been settled, to be adopted by public health agents regarding migrants' health. Public health should guarantee the same access on health for all, certify that migrants enjoy their health rights entirely, diminish mortality and morbidity among migrants and decrease the negative aspects caused by the migration procedure (11, 27). Furthermore, the agenda 2030 reinforce the right to health by promoting it, reducing mortality and obtaining worldwide health coverage (15).

Although these efforts to improve migrant health, it has been reported inequities between migrant and native people as well as between specific groups of migrants in regards to use of healthcare services (28) and health outcome (29). For *pregnant or breastfeeding women*, it is important the use of and access to healthcare services (30) in order to improve maternal and child health. Therefore the equity between natives and migrants in the access to health services is particularly important in these groups (31). It has been recommended universal access to maternal health, emergency facilities, and information's about sexual and reproductive health (30). However, the UN recognizes that some challenges appear in the achievement of the millennium objectives, which curb the way to going forward, specifically in the maternal, newborn and child health issues (15).

A body of research has reported about disparities in maternal and child health between foreign-born and native groups including the use of prenatal care (32), as well as in the rates of obstetric care (33), preterm delivery, congenital malformation (34), perinatal death (35), severe maternal morbidity (36) and child morbidity (37). In Portugal, it has been documented the higher risk of adverse outcomes during pregnancy and higher fetal and infant mortality (38) among migrant in comparison with native Portuguese population, which might occur due to inadequate use of and access to health services (38, 39).

Inequities in the access to sexual and reproductive health by migrant people have been explained based on *social and cultural* features, *language* (40-42), *economic aspects and stigmatization* (41, 42). These circumstances can cause a gap in the information's regarding some sexual and reproductive issues such as breastfeeding, leading to the non- use of such practice (42). In Portugal, these difficulties, including the difficulty of access due to the legal status, has been described in a study conducted through focal groups analyzing the perception of migrants on health care services (43). The lack of access, due to the invoke reasons above, influenced negatively migrants mental health in the postpartum period (44). Indeed higher risk of postpartum depression among migrants has been reported (42, 45).

Although the vulnerability of migrant people, a body of research reported the "*healthy immigrant paradox*," which stated that newborn from migrant women might have better health status than the native ones (46), including lower rate of infant mortality (47), lower rate of low birthweight (48), or higher probability of favorable evolution among preterm newborns (49, 50). It seems important to understand which factors might influence the "*healthy immigrant paradox*" such as cultural aspects and lifestyle (47).

For these reasons, it is essential to promote research on this field to understand for each country not only the barriers in the access of migrant women to reproductive and sexual healthcare services but also the factors underlying healthier outcomes among migrant people. Such knowledge will improve the perinatal healthcare services (51).

The "Agenda 2030" pointed out that "*universal access to sexual and reproductive healthcare services, including for family planning, information and education*" should be assured (15). This statement spotlighted the importance of the integration at a national level of equity in the access to healthcare for all people, regardless of their legal status. Legislation on this topic had been already implemented in countries such as *Portugal, Spain, and Brazil* (11). In so far, in Portugal, costless access to anyone should be guaranteed for instance in *prenatal care, family planning, perinatal care and women health* (52).

### 1.7 Challenges related to migrant women across Portugal

The Gulbenkian Foundation supported that the Portuguese National Health System has made several improvements, but it will not be enough to respond to future demands (23). Indeed, migrant women in Portugal witness barriers in regards to health care access (38, 43), highlighting challenges for the National Health System and the need of adequate health policies. Therefore, policy-makers should be able to identify inequities and barriers related to migrant women in the access to reproductive and perinatal health services. It is important to understand the determinants of birth's outcomes related to the migrant women. Several determinants of perinatal outcomes among migrant groups have been recognized and classified into four categories: Cultural, Socioeconomic, Biological and Health System determinants. One of the most important determinant is the access to healthcare during pregnancy in the host country (53). Identifying the barriers to the access to the health system by migrant (38, 53, 54), would overcome such barriers. As a result of all the needs and demands seen above the project "*Migrants and Perinatal Health: Barriers, Incentives, and Outcomes*" with the acronym "*baMBINO*" has been settled.

### 1.8 An emergent research in Portugal: Migrants and Perinatal Health: Barriers, Incentives and Outcomes – the baMBINO Project

The baMBINO project has been developed by the "Instituto de Saúde Pública da Universidade do Porto", funded through the "Fundação para a Ciência e a Tecnologia". This project aims to understand the use of and the access to healthcare during pregnancy, birth and post-partum period and how they influence disparities in perinatal outcomes between migrant and native women. The research project was designed to compare migrant and native women delivering a newborn in Portuguese public hospitals, in regards to the access to prenatal care and its content, rates of obstetric interventions, rates of adverse birth outcomes, use of healthcare services during post-partum period and the satisfaction with perinatal health care services. Considering the aims of the project and the definition used by the European Union Health Programme in the classification of projects, the project baMbino is a research project in which evidence-based knowledge is acquired based on problem identification with relevance in public health field (55).

Effects of cultural, linguistic and administrative barriers in migrant access to care and health outcomes will be assessed. To pursue all these objectives, a national survey grounded in all public maternity units in mainland Portugal has been conducted. Firstly, maternity units in public hospitals across Portugal were invited to participate in the project. After the approval of the directors of the maternity units and the Ethics Committee (EC) of each hospital, the project was implemented.

Within each hospital, there were focal points assigned by the director of the maternity unit and these focal points were responsible for the recruitment process. This process occurred during the delivery related hospital stay. The eligibility criteria were applied in all maternity units enrolled in the project and were based on having at least one live birth (women aged less than 18 years were excluded due to legal reasons). All migrant women were considered eligible participants. Women born outside of Portugal were considered as a migrant (case). For each migrant woman who accepted to participate, the focal point should invite a native woman (control) having delivered a baby immediately after the migrant woman, such that migrant and native women were invited by a factor of 1:1. If the invited women accepted to be part of the project an informed consent according to the Helsinki Declaration, need to be signed by them.

Data collection was divided into two steps. Firstly, the focal points collected a set of clinical variables from clinical records. The data would be inserted into an online platform created for this purpose. Secondly, the participants have been contacted by interviewers, three months after the childbirth and a computer-assisted telephone interview (CATI) should be conducted (56). Information about several health indicators have been collected through the *"Migrant Friendly Maternity Care Questionnaire (MFMCQ)," the Edinburgh Scale (EPDS) and the breastfeeding questionnaire.*

The interviewers were previously trained (57) to guarantee a standardized approach (58) in regards to the conduction of phone interview. A manual of procedures was written by the team supporting all procedures in regards to phone questionnaires. The interviews were structured as followed: 1) Overall presentation with information about the time duration of interview; 2) Application of the MFMCQ; 3) Application of the BQ; 3) Application of the EDPS; 4) Response to doubts rise by the participants and requesting the approval of future contacts.

The MFMCQ has been developed by an international team "Reproductive Outcomes and Migration (ROAM)"(59). This questionnaire is structured in seven different topics covering 111 questions for migrants from which 89 questions were also asked to natives. The breastfeeding questionnaire incorporate eleven questions dispersed by four different topics. The EPDS encompass 10 questions (60, 61) (**Table 2**).

**Table 2: Contents of the MFMCQ, EPDS and Breastfeeding Questionnaire.** Source: 1) the **MFMCQ**: Gagnon AJ, DeBruyn R, Essén B, Gissler M, Heaman M, Jeambey Z, et al. 2014 ; 2) the **EPDS**: Cox, J.L., Holden, J.M., and Sagovsky, R. 1987. K. L. Wisner, B. L. Parry, C. M. Piontek. 2002. and for 3) the **BQ** which was created to integrate the baMBINO project.

<b>MFMCQ</b>		
Set of questions:	Questions number:	Data collected:
1) Migration	1-3; 88; 90-99; 102; 108-110	- Information about 1) maternal country of birth and the time spend in Portugal; 2) the migration history; 3) fluency in Portuguese language.
2) Health care services provided in Portugal.	4-7; 9; 13; 15-16; 20-23; 26-27; 29-34; 36-44; 57-59; 67; 71	- Data on the services used, on the information and on the healthcare received during pregnancy, labour and after birth. - Information about personal preferences on care and food. - Data on linguistic barriers and the use of interpreting services.
3) Obstetric aspects of the most recent pregnancy in Portugal.	8;17-19; 25	- Information regarding obstetric interventions, practices and outcomes occurred during labour and birth. - Data on gestational age and birth weight.
4) Obstetric history	78-85	- Capture of information concerning previous pregnancy.
5) Overall maternity healthcare experience	10-12; 14; 28; 35; 45-56; 60-70; 72-77	- Assessment of the satisfaction and expectations regarding the healthcare received and services used during pregnancy, labour/ birth and after birth. - Data on perceived linguist barrier and satisfaction with the interpretation.
6) Sociodemographic features	86-88; 90; 101-102; 104-108	- Data on 1) marital status; 2) the family composition; 3) maternal date of birth; 4) health service found; 5) education level; 6) labor and 7) income of the household.

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**BQ**

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- |  |        |   |
|--|--------|---|
| 1) Feeding Practices                                   | 1 - 6  | - Information about the breastfeeding, infant formula, water, other liquids and other ailments. Within the mention of the age of the first liquids or aliments introduce in the child alimentation. |
| 2) Exposure to commercial practices                    | 7 - 8  | - Appraisal concerning the influence of breastmilk substitutes industry marketing.  |
| 3) Sources of information about the feeding practices  | 9 - 10 | - Main sources of information regarding breastfeeding and infant formula.   |
| 4) Comparison between breastfeeding and infant formula | 11     | - Perception of the participants comparing the quality between breastmilk and infant formula.   |
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**EPDS**

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- |   |    |   |
|---|----|---|
| 1) Appreciation of the felt of the women in the last past 7 days. | 10 | - Information about how the women were feeling after giving birth considering the last past 7 days. |
|---|----|---|
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### 1.9 The Challenges in implementing a nationwide research project

Several aspects should be taken into account when implementing a research project at a national level. The report of obstacles, delays, refuses and other barriers when implementing a nationwide research project could give insights about study design and planning of future research in this field and this setting. As happened with the implementation of specific evidence-based interventions (62), understanding the context where research project has been implemented is an important step to overcome obstacles that could hamper the conduction and the quality of research.

The recruitment process is an important step in research since that the required representability of a sample (63) depends on this process. However, diverse challenges have been identified through the recruitment process for instance in the involvement of the organizations or either based on the participants and recruiter features (64, 65). Before the implementation of a research and the outset of the recruitment process, ethical concerns required to be carried out. Therefore, the necessity to obtain ethical approbation within a clear definition of the eligible participants and a transparent procedure of the method used to contact them (66) guarantying the confidentiality of the data. This is particularly important for baMBINO project because it intended to enroll 39 maternity units with a different dimension, internal organization, rules, and protocols. Each EC has different demands, requirements and time waiting to reply, which could preclude the compliance with the preview time for the project implementation.

Other ethical issues have been considered in the project such as the confidentiality of the information, informed consent of the participants, the voluntary aspect of the participation, the selection of the information given to the participation and the understandability (63, 66). However, barriers and difficulties have been described in the literature regarding this process which might be even more challenging on migrants for instance due to the language barriers (64, 67). A study demonstrated that migrant's women are more likely to undertake an uninformed choice as natives women (68) which endorse the importance of providing information based on the features of the target population (68, 69) and in an understandable language for each participant (63, 64). Nevertheless, recruiting participants requires time and effort as recognized in previous research (63, 65, 69) and such factors are determinants of the timeline demanded to achieve the sample size. Requiring adaptations of the timetable of the baMbino project defined into the study design (56).

Given that the recruitment has been conducted firstly by focal points in each maternity unit, understanding the context of each hospital in regards to the organization, to the human



resources and to the administrative procedures, it is important in a research to take in count each factor in regards to the implementation process (70). Furthermore, a funded project demands to comply with the preview timeline, as well as, rigorous management of resources allocated to the project. The knowledge about difficulties that focal points have faced during the recruitment process could be useful to understand how theoretical design of the recruitment procedures could work. However, it has been recognized that the recruitment process might be more efficient with a strong collaboration between the research team and the persons which identify the participants. Divers process are established to endorse this collaboration such as a clear procedure on the recruitment with a precise definition of the potential participants or regular contact with the person of the organization involved into the research (63). These process has been settled into the baMbino project, although challenges might occur in the creation of collaboration. Reporting such challenges, gives the opportunity to identify effective strategies for future research. Secondly, data collection in baMBINO project was based on phone interviews, and this approach adds more challenges in the conduction of the project. Since that women might have accepted to participate in the maternity units, however, are not reachable by phone due to diverse circumstances. As a result, divergences between the number of recruited women by the focal points and those who respond to the interview might be observed.

However, the generalizability of research is influenced by the number of participants meaning the sample size (71), therefore the necessity to understand which challenges might arise in the application of questionnaire through CATI. The use of CATI allows an easier form of the interview, an electronic data format and the recognition of error in real work. Also, the creation of *paradata* allows obtaining information for instance, on demographic data or calls records (72, 73). Identifying socio-demographic features on response rate in a survey in Portugal might improve further investigation on the recruitment process in a target population. Therefore, *paradata* might be used to reduce non-response bias by the implementation of strategies regarding particular groups after the identification of a pattern based on socio-demographic characteristics (73).

Overall, this study aims to recognize the challenges faced in implementing the baMBINO project and to identify causes about factors that could hamper the compliance with study design and preview timeline.

## 2.) Aims

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This research aims to analyze and to identify challenges in the implementation process of the research applied to "*Migrants' Perinatal Health*," through the following objectives:

1. To identify challenges related with the implementation of a national survey in the maternity units of the public hospitals across Portuguese regions.
2. To identify challenges in data collection by CATI from migrant and native women.

### 3.) Chapters

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*Structure followed by the guidelines for submission to the Porto Biomedical Journal.*

### **3.1) Challenges in the implementation of a national survey to assess perinatal health among migrant women in Portugal**

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### 3.1.1) Abstract

A national survey (baMBINO project) has been settled in Portugal having as the main goal to perceive how perinatal healthcare services are experienced by native and migrant women. The goal of this study was to identify challenges during the implementation process of a national survey.

**Methods:** baMBINO project enrolled migrant and native women recruited in 33 Portuguese hospitals during admission for delivery. Focal points were responsible for the recruitment and clinical data collection. Trained interviewers conducted computer assisted telephone interviews (CATI) for data collection 3 months after delivery. Time-delay for each step of the project implementation and the real and expected number of women recruited per week by focal points were computed. Participants were classified according to CATI outcome into three groups: women who began the interview, women with no phone contact or unsuccessful phone contact and refusals. Differences between women who began and those who didn't begin CATI were assessed by using adjusted logistic regression model.

**Results:** The mean time-delay between the first contact with the hospitals and the beginning of the recruitment was 4.1 ( $\pm 2.54$ ) months; There was a difference between real ( $n=90$ ) and expected ( $n=230$ ) number of recruited women per week. From 4929 participants, 3% refused CATI, and 31% had no phone contact or unsuccessful attempt of CATI. There were significant differences between participants according to the CATI outcome in regards to age, maternal country of birth, parity and Portuguese region where women were recruited.

**Conclusion:** This study demonstrated that there are time-delays during the implementation of a national survey and a difficulty in obtaining the expected number of participants. Moreover, data collection through CATI has some advantages, but the final sample didn't match the expected one.

**Keywords:** *Women, Migrants, Perinatal Care, Challenges, Implementation process*

### **3.1.2) Introduction**

Human movement across borders has been steadily increasing around the world. In 2017, the number of international migrants worldwide hit 258 million and 30% of migrant people lives in European countries (1). Migrant people are a vulnerable group (1-5) due to multiple factors such as human rights transgression (3), language barriers, administrative adversity related with documentation (4), cultural characteristics (5, 6) and lack of information about how healthcare services work in the host country (6).

As women at reproductive age correspond to an increasing proportion of the migrant people, at least in developed countries, specific demands are emerging from this particular group in regards to maternal healthcare. Indeed, perinatal health is a sensitive topic when the access to and utilization of healthcare services by migrant groups are under discussion. A higher risk of late prenatal care initiation and inadequate use of prenatal healthcare services among migrant women in comparison with native ones has been reported (7). Such differences could explain worse perinatal outcomes among migrant groups (8). Indeed, migrant women compared to native women, present a higher risk of perinatal death (9), preterm delivery (10), perineal laceration, postpartum hemorrhage (11) and are more likely to have a cesarean section (11, 12).

In Portugal, 53% of migrant people are women, and 70% of them are at a reproductive age (13) highlighting the challenges of policy-makers to understand and overcome barriers in the access to and utilization of perinatal healthcare by migrant population. However, as migrant flow in Portugal has been linked to former colonial ties up to 1975 (14), 54% of foreign-born came from Brazil and Portuguese-speaking African countries (PSAC) (13). Therefore, Portugal is different from other countries, as language barriers and cultural characteristics are not expected for the majority of migrant people (12).

Achieving equity in perinatal health care access is a challenge for policy-makers in the field of public health. However, this goal demands to understand factors that could have an impact on the access to and utilization of perinatal healthcare services. Therefore, a research project - Migrants and Perinatal Health: Barriers, Incentives, and Outcomes (baMBINO project), has been conducted in Portugal. The main goal of this research is to understand how perinatal healthcare services are experienced by native and migrant women. It is expected to obtain insights about factors underlying disparities in the access to and utilization of healthcare services by different groups according to the country of origin. This research was approved by the Ethics Committee of the Instituto de Saúde Pública da Universidade do Porto (CE14013; 14<sup>th</sup> March 2014) and by the National Committee of Data Protection.

The baMBINO project is a national survey, and the recruitment of participants should take place in all public hospitals with maternity unit in mainland Portugal (n=39). The sample

size for this research was fixed at 7000 women admitted for childbirth and aged 18 or more years (3500 migrant and the equal number of native women). According to the study design, all migrant women (defined as those born in a foreign country) are eligible, and for each migrant selected for the study, native women delivering a live birth immediately after will be successively invited until acceptance is reached. Therefore, native women will be randomly selected by a factor of 1:1.

Focal points assigned to each hospital are responsible for the recruitment process. Taking into account the number of deliveries among migrant women reported in Portugal over a calendar year, it was estimated that the recruitment process would occur during at least 9 months to reach the intended sample size.

Data collection has been planned based in two steps. The first one occurs during the recruitment process, should be handled by focal points and includes sociodemographic and clinical and obstetric variables obtained from clinical records. Focal points were invited to insert these variables into an online platform created for this effect. The second step should occur 3 months after the delivery and is based on a computer-assisted interview (CATI) conducted by trained interviewer of the baMBINO team and includes the application of the “*Migrant Friendly Maternity Care Questionnaire*” (MFMCQ), a “*Breastfeeding Questionnaire*” (BQ) and the “*Edinburgh Postnatal Depression Scale*” (EPDS) (15).

However, a national survey like the baMBINO project requires complex methodologic approach due to the involvement of a large team disperse by several maternity units with different rules, protocols, and administrative procedures. Furthermore, the participation of migrant women is an added challenge due to language barriers, or cultural features (16). Moreover, the implementation of the baMBINO project demands the previous acceptance by the Director of the maternity unit, the approval by the Ethical Committee of each hospital invited and the assignment of focal points selected from staff on duty in the maternity unit.

Compliance with a timetable, rigorous management of resources allocated to the project, as well as the awareness in regards to the methodological obstacles, are crucial issues when implementing a funded research project. Therefore, the surveillance of the research implementation a nationwide survey could be essential to understand reasons underlying time-delay, to detect a mismatch between allocated and demanded human resources, to assess the effectiveness of the process as a whole and the design strategies to overcome obstacles. The literature on methodological barriers during research implementation is scarce, emphasizing the need for future publications to improve the design of future research (17).

In so far, this study aims to provide descriptive data about all procedures for implementing the ongoing baMBINO project in regards to timeline, the assessment of the



recruitment and data collection in a national survey related to perinatal health among migrant and native women.

### **3.1.3) Methods**

This study used information about the implementation of the baMBINO project, taking into account the contact with directors of the maternity units asking about enrolment in the research, submission of the research to the Ethics Committee (EC) of each hospital, the recruitment of participants and data collection at recruitment and 3 months after delivery.

Regarding the contact with each maternity unit and the submission of the project research to the EC of each hospital, the following variables were collected: 1) invitation send to the directors of each maternity unit and respective decision; 2) number of focal points assigned to each hospital and their professional category; 3) submission date to EC of each hospital that accepted to participate; 4) date of EC reply and respective decision; 5) date of first delivery reported in each maternity enrolled (correspond to the begin of recruitment process), 6) number of focal points in each hospital, their respective professional category and the method used (online platform or paper) by them regarding the insertion of the clinical data.

Waiting time was computed as number of months between: 1) submission date to EC and respective date reply; 2) date reply from EC and the date of first delivery reported from the respective maternity unit; 3) submission date to EC and the date of first delivery reported (total delay time). Mean and respective standard deviation for waiting time were computed.

To assess the recruitment process, focal points were asked to report the total number of deliveries and the number of deliveries among migrant women that occurred in the respective maternity unit during the week 22th May 2017 and 28th May 2017. Based on the reported number deliveries among migrants, the expected number of women to be recruited per week in each maternity unit was computed, taking into account that native and migrant women should be recruited by a factor of 1:1. The expected number of women recruited in each hospital over the total of months of recruitment was converted into a real number of recruited women per week (one month=4weeks). The difference between the real number of recruited women and the expected number of women to be recruited was computed for each maternity unit. Also, the following data were computed: 1) number of invited women throughout the recruitment process (until 25<sup>th</sup> July 2018) and 2) number of women who refused to participate and the reasons underlying refusal. Focal points should give the number of all invited women as well as the number of refusals and the reason underlying refusal.

In regards to the data collection 3 months after delivery (CATI), women who accepted to participate during recruitment were classified according to the outcome into three groups according to the outcome of phone contact: those who began phone interview (completed or

incomplete questionnaires), those with missing phone contact or unsuccessful attempt of phone contact and those who refused phone interview. Women who were waiting for phone contacts were excluded. The following variables have been obtained: 1) number of women according to the phone contact; 2) the number of the different languages identified and the type of translator who conducted the interview; 3) socio-demographic characteristics (age, maternal country of birth, education level, marital status, parity and Portuguese region where women were recruited) of participants according to the outcome of phone contact.

#### 3.1.3.1) Statistical Analysis

For this purpose women recruited in Alentejo were excluded because only 8 women were recruited there. After excluding women who were waiting for phone contacts (n=390) the groups according to the outcome of phone contacts were compared in regards to the socio-demographic characteristics. Then, the outcome of phone contacts was dichotomized into women who began and those who did not begin the phone interview. The association between socio-demographic characteristics and the outcome of phone contact was assessed by using a logistic regression model. This model included all socio-demographic variables significantly associated with the outcome of phone contact in the univariate analysis. Odds ratio (OR) and respective 95% confidence interval (95%CI) were provided. The significance level was set at 0.05.

#### **3.1.4) Results**

##### 3.1.4.1) Time-delay in implementing a recruitment process

Out of 39 maternity units invited to participate in the baMBINO project, there were two refusals (5.1%) by the directors of the maternity unit due to lack of resources, as explained by them, one refusal due to a non-approval by the EC (2.6%) and a maternity unit that was excluded due to a non-response by the director (2.6%). Furthermore, there are two maternity units waiting for a response from EC (5.2%).

Among the 33 maternity units that accepted to participate, we observed significant variability in the time spent between the submission of the project to the EC and the respective reply. The average response time was 2.7 ( $\pm 2.49$ ) months varying from 0.3 to 11.0 months between hospitals. The average waiting time between the date of approval by the EC and the beginning of the recruitment process in the maternity units, was 1.7 ( $\pm 1.67$ ) months varying from 0.0 to 7.6 months between hospitals. The average of time spent between the submission of the project to the EC and the effective beginning of the project was 4.1 ( $\pm 2.54$ ) months, varying between the hospitals from 0.0 to 12.4 months. However, up to July 2018, the hospital with the code AK did not report any deliveries. The time-period of recruitment varied across

hospitals between 0 and 15 months, with an average of 12.5 ( $\pm$  2.51) months (**Supplementary Material – Table 1**).

The number of focal points in each hospital varied from 1 to 6. Out of 95 focal points enrolled in the project, 90.0% (n=86) were obstetricians, and the remaining 10.0% (n=9) were nurses. There are 12 hospitals with 1 or 2 focal points, all of them obstetricians (n=29) and 21 hospitals with 3 or more focal points corresponding to a total of 57 obstetricians and 9 nurses. Although all focal points were invited to insert clinical data into an online platform, data from 15 (45.5%) of the hospitals were collected by using paper, corresponding to **3754 (72.5%)** clinical questionnaires.

#### 3.1.4.2) Recruitment process in the maternity units

For 26 maternity units which provided the information about the number of deliveries among migrant women during the week 22<sup>nd</sup> -28<sup>th</sup> May 2017 the real number of recruited women was compared with the expected number of women to be recruited until 25<sup>th</sup> July 2018. The expected number of recruited women per week varied across hospitals between 0 and 48 giving a total number of 230 expected recruited women per week. However, the total number of real recruited women per week was only 90.

Furthermore, 19 maternity units had a negative result for the difference between the real and the expected number of recruited women, varying across hospitals between -45.9 and -1.0. All other maternity units showed negative results in regards to the difference between the real and the expected number of recruited women, varying from 0.9 to 7.5 (**Supplementary Material – Table 2**).

#### 3.1.4.3) Interview 3 months after delivery (CATI)

As shown in **Figure 1**, between 4<sup>th</sup>/April/2017 and 25<sup>th</sup>/July/2018 a total of 5140 women were invited to participate in the project, from which 211 (4.1%) were refusals. Out of 211 refusals, 132 women gave information about the reasons underlying refusal. The main reasons assigned were the lack of interest (67.4%; n=89) and lack of time (13.6%; n=18). Out of 4929 (95.9%) women who accepted the invitation, 55.3% (n=2727) were migrant and 0.6% (n=27) had no information about country of origin.

Out of 4929 who accepted to participate during the recruitment process, 151 (3.1%) refused the interview, 1582 (32.1%) of them had no phone contacts or unsuccessful attempts of phone contact, 390 (7.9%) were recently added to the database and are waiting for phone contacts, and 2806 (56.9%) began the phone interview. Women with completed phone interview were 2670, and 54.3% (n=1449) were migrant women.

Phone interviews among migrant women were conducted in 22 different languages. Out of the 22 languages, 14 were fluently spoken by the interviewers of the team or volunteer interviewers. Nevertheless, the baMBINO project received the support from the National High Commissioner for Migrations and hired freelance translators in regards to 9 languages (**Table 3**).

**Table 4** displays the socio-demographic characteristics for all women who accepted to participate during the recruitment and for each group by the outcome of the phone contact (after excluding 390 women who are waiting for phone contact). Socio-demographic characteristics were compared across groups by the outcome of phone contact. Accordingly, women who began the phone interview were older ( $p < 0.001$ ), were less likely to come from PSAC, South Asia and East Asia and Pacific ( $p < 0.001$ ) and to be recruited in the region Lisboa e Vale do Tejo but they were more likely to have higher education level ( $p < 0.001$ ) and to be a primiparous woman ( $p < 0.001$ ) than other women. After adjusting for all sociodemographic variables, the chance of beginning the phone questionnaire increases 5% as maternal age increases one year (OR=1.05; 95%CI: 1.04, 1.07) and women from Eastern Europe and Central Asia had 47% higher odds of beginning the phone interview (OR=1.47; 95%CI: 1.09, 2.00) than native women. Furthermore, women recruited in the region Lisboa e Vale do Tejo were 51% less likely (OR=0.49; 95%CI: 0.40, 0.59) than women recruited in the region Norte and multiparous women were 33% (OR=0.66; 95%CI: 0.57, 0.76) less likely than primiparous women to begin the phone interview (**Table 5**).

Furthermore, a total of 21706 phone contacts were performed from which 9253 (42.6%) among women who completed the interview. The mean number of phone contacts for each completed phone interview was 3.5 ( $\pm 2.60$ ). This mean varied according to the maternal country of origin, between 3.2 among women from Latin American and Caribbean and from South Asia and 4.2 among women from Western Europe ( $p = 0.040$ ) (**Table 6**).

### **3.1.5 Discussion**

The present study reported some challenges in implementing the baMBINO project that is a national survey enrolling migrant women. Challenges identified in the implementation process were based: 1) on the time-delay between the submission of the project to the EC of each hospital and the beginning of recruitment; 2) on the differences between the real ( $n=90$ ) and the expected ( $n=230$ ) number of recruited women per week and 3) on the refusal of focal points from 15 hospitals in collecting the clinical data through the online platform. The main problems regarding data collection at 3 months after delivery (CATI) were related with the missing phone contact or the unsuccessful phone contact for one-third of recruited women and with the difficulty of translation of some languages. It is

noteworthy that women who answered the phone interview differed from those with missing or unsuccessful phone contact in regards to socio-demographic characteristics.

The implementation process of the baMBINO project in the maternity units was a time-consuming task due to the complexity of the procedure underlying the submission to the EC in some maternity units, as well as the differences in EC demands across hospitals. These factors rise the time spent in the implementation of a research project, increasing barriers in clinical research within the hospitals. In the literature, it has been stated that the time-delay between the submission and decision of EC might be prolonged (18, 19) demanding efforts to decrease time spent for ethical review (19). The implementation of a national survey like baMBINO project could be easier if the submissions to EC were based on standardized procedures across hospitals.

Work burden has been described as a barrier to engaging health professionals in the recruitment process for research proposal (20). Although the existing workload among obstetric care providers in the Portuguese hospitals, only two directors refused the participation in the project baMBINO and the reason pointed out by them was the lack of human resources. This study spotlighted that for the majority of Portuguese maternity units there is a positive attitude and involvement toward research.

The baMBINO team scheduled meetings with focal points ensuring that they were informed about recruitment strategy and making available adequate recruitment material (flyers, free consent forms, study protocol). Moreover, almost all focal points which were responsible for recruiting participants for baMBINO project were obstetricians in duty in the respective maternity unit. However, there were differences in the level of engagement of focal points in the recruitment process. Indeed, 50% of the hospitals recruited less number of women than the expected based on the volume of deliveries among migrant people with large variation across maternity units regarding the differences between the real and the expected number of recruited women. Variation between focal points (=mostly obstetricians) in the level of involvement with the baMBINO project. Such differences can be explained by differences between recruiters in the level of interest in the research tasks, workload, as well as the lack of support from other professionals in regards to the identification of eligible women and the explanation of the project to these women which are time-consuming tasks.

Time-delay for the implementation process and the lower number of recruited women by focal points (90 women per week) in comparison with the expected number (230 women per week), had an adverse effect on the time planned for the recruitment process in the baMBINO project (= 9 months) requiring an extension (= 15 months). The communication between the research team and recruiters has been considered a factor with positive impact in the recruitment process of women (21). Keeping this assumption, the baMBINO team

established contact with focal points to improve the recruitment process. However, the number of recruited women remained lower than the expected.

Another obstacle to fulfilling the planned timeline of the project baMBINO emerged from the recruitment process designed in the project. As referred above, it was expected that the focal points would insert the clinical data into the online platform created for this purpose. However, focal points from 15 hospitals refused the insertion of clinical data into the online platform based on a lack of material resources (computers or internet). To overcome this issue, changes in the data collection were required by the baMBINO team demanding visits to the hospitals, which were organized every two months to collect the clinical data on a paper form. This adaptation to the original design required additional resources including, the cost associated with travel across Portuguese regions and for the hired workforce who were responsible for online insertion of the clinical data.

Until three months after delivery, the women who accepted to participate in baMBINO project were contacted by an interviewer to conduct the phone interview through CATI. Studies generally reported that migrant population are less prone to answer questionnaires for survey proposals (22, 23) because the communication with migrant people might raise challenges due to language barriers or particular cultural features (24). This is not in accordance with our results. Overall migrant and native women are very similar in regards to the proportion of women who began the phone questionnaire. Strategies adopted by the baMBINO project included enrolling native speaker translators who spoke the maternal language. Therefore, such translators were included in the team as interviewers, and it was planned the collaboration of the National High Commissioner for Migrations and hired free-lancer translators to cover languages not spoken by interviewers. Such an approach has been reported by previous studies, as a factor that increases migrant's trust in the research team and therefore increases their participation (24, 25).

However, some difficulties raised regarding the collaboration between the interviewers and the National High Commissioner for Migrations. For instance, free-lancer translators and translators assigned by the National High Commissioner for Migrations had little time to comply with the demands of the baMBINO project. Moreover, interviews conducted by back translation took more time. Therefore, women were more prone to interrupt and might not complete the interview even after several attempts of phone contacts. As stated, a survey which takes more time is more prone to a lower response rate (26). Data collection through new technology methods made it possible to generate paradata (27). Several paradata have been identified such as phone call record data or interview's history (28). Paradata allows to create patterns of phone attempts of the interviewers to reach participants enabling to modify the phone procedure, as recommended by some authors (27,

29). Results based on paradata showed that the mean of contacts to complete an interview varied between 3 and 4, according to the maternal country of birth with the highest mean among women from Western Europe.

A survey conducted by phone interview presented several advantages such as the possibility to schedule an appointment or to contact participants located in different area of a country (30). Those aspects are essential in the baMBINO project since that it is a national survey of participants living in different Portuguese regions. Also, the possibility to schedule is not negligible considering that the phone contacts are done to women after delivery who might have other children and could be busy at this moment allowing to schedule for later or another day. This approach has been considered a factor that increases the survey response rate (31, 32).

As demonstrated by our results one of the main challenges to conduct phone survey was the difficulty to reach participants due to missing contacts or attempts of phone contact without success. From all recruited women only 3% refused to answer the phone interview, but almost one third had missing phone contact or unsuccessful attempt of phone contact with a negative impact in the final sample size. One of the reasons for the participants who not reply or in some cases blocked the number might be the assumption that attempts of phone contacts are realized for marketing proposal (33) for instance, to sell a product. Also, the use of mobile phone allowed the participants to put it in silence mode or either blocked the contact (34). In this way, they are not disturbed by the phone contact.

However, to overcome missing phone contacts and to increase the participation rate, a member of the project team was assigned, to contact the focal points and to confirm the phone numbers of participants but in the majority of the cases, another phone contact wasn't available. However, these steps required time.

Noteworthy is that one with missing phone contact or unsuccessful phone contact showed differences in sociodemographic characteristics when compared with women who began the phone interview. As age increased, also increased the probability to begin an interview and women from Eastern Europe and Central Asia were more likely to begin the phone questionnaire than native women. Furthermore, women who were recruited in Lisboa e Vale do Tejo were less prone to begin the phone interview than women recruited in Norte and the same was observed among multiparous in comparison with primiparous women.

Data collection used in the baMBINO project had some advantages as stated above, however using such an approach showed huge differences between participants according to the outcomes of phone contact in regards to their socio-demographic characteristics. Concerning such characteristics, the final sample didn't match the expected one.

This study demonstrated that future national survey requiring the involvement of public hospitals need to adjust the timeline regarding the time-delay necessary for the implementation of a project. Future research should guarantee the feasibility and cooperation by the focal points. We should be aware of the problems related to data collection by phone interviews, namely the difficulty to contact of some groups of women.

In overall, future research might be realized to isolate the most effective method on time and costs to overcome obstacles identified in this study regarding the implementation and the recruitment process into a national survey. The importance of reporting barriers resides on the possibility to anticipate them in future research increasing efficiency, in the recruitment process, sample size and generability of the study.

**Acknowledgments relating to this article:**

To the baMBINO team for all the contribution and collaboration for the accomplishment of this paper. To all the involved maternity units and focal points. Moreover, to all the women being part of the baMBINO project regarding the time spent during the interview, for their comprehension, and for their availability to continue in the baMBINO project.

Conflicts of interest: none.



### 3.1.6) References

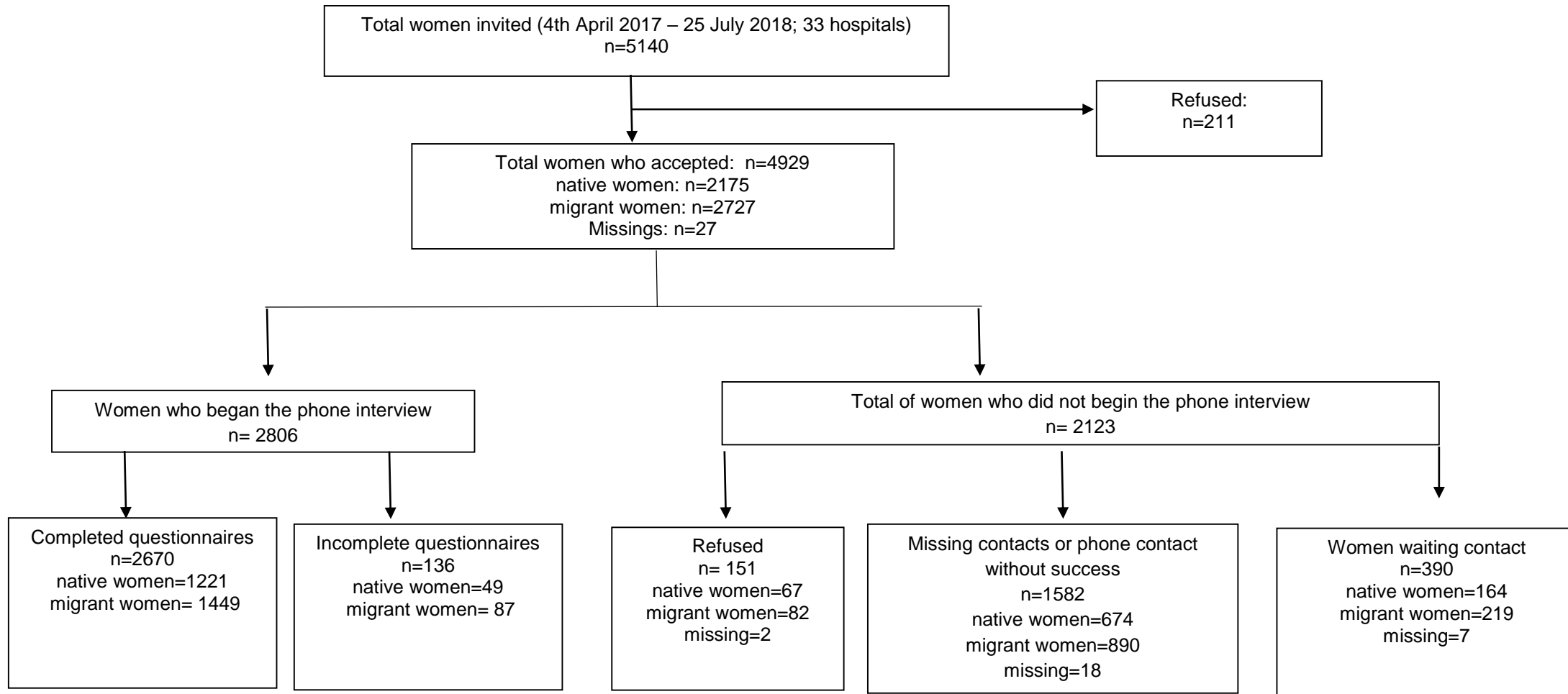
1. United Nations, Department of Economic and Social Affairs PD. International Migration Report 2017 . 2017 : 4-17. [cited 2017 12/21]. Available from: [http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017\\_Highlights.pdf](http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf).
2. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. Gen Assem 70 Sess. 2015;16301(October):1–35. .
3. IOM, WHO, UN. International Migration, Health and Human rights. 2013 : p. 64. [cited 2017 10/12]. Available from: [http://www.ohchr.org/Documents/Issues/Migration/WHO\\_IOM\\_UNOHCHRPublication.pdf](http://www.ohchr.org/Documents/Issues/Migration/WHO_IOM_UNOHCHRPublication.pdf).
4. Bradby H, Humphris R, Newall D, Phillimore J. Public health aspects of migrant health: a review of the evidence on health status for refugees and asylum seekers in the European Region. Copenhagen: WHO Regional Office for Europe; (Health Evidence Network synthesis report 44). 2015:33.
5. MacFarlane A, O'Reilly-de Brun M, de Brun T, Dowrick C, O'Donnell C, Mair F, et al. Healthcare for migrants, participatory health research and implementation science--better health policy and practice through inclusion. The RESTORE project. The European journal of general practice. 2014;20(2):148-52.
6. Suphanchaimat R, Kantamaturapoj K, Putthasri W, Prakongsai P. Challenges in the provision of healthcare services for migrants: a systematic review through providers' lens. BMC Health Serv Res. 2015;15:390.
7. Heaman M, Bayrampour H, Kingston D, Blondel B, Gissler M, Roth C, et al. Migrant women's utilization of prenatal care: a systematic review. Maternal and child health journal. 2013;17(5):816-36.
8. Linard M, Blondel B, Estellat C, Deneux-Tharaux C, Luton D, Oury JF, et al. Association between inadequate antenatal care utilisation and severe perinatal and maternal morbidity: an analysis in the PreCARE cohort. Bjog. 2018;125(5):587-95.
9. Essen B, Bodker B, Sjoberg NO, Langhoff-Roos J, Greisen G, Gudmundsson S, et al. Are some perinatal deaths in immigrant groups linked to suboptimal perinatal care services? Bjog. 2002;109(6):677-82.
10. Bollini P, Pampallona S, Wanner P, Kupelnick B. Pregnancy outcome of migrant women and integration policy: A systematic review of the international literature. Social Science & Medicine. 2009;68(3):452-61.
11. Almeida LM, Santos CC, Caldas JP, Ayres-de-Campos D, Dias S. Obstetric care in a migrant population with free access to health care. International Journal of Gynecology & Obstetrics. 2014;126(3):244-7.
12. Teixeira C, Correia S, Victora CG, Barros H. The Brazilian Preference: Cesarean Delivery among Immigrants in Portugal. PLOS ONE. 2013;8(3):e60168.
13. United Nations- Department of economic and social affairs- Population Division- International migration: Monitoring global population trends. 2015. [cited 2018 07/23]. Available from: <http://www.un.org/en/development/desa/population/migration/data/estimates2/estimates15.shtml>.
14. Malheiros Jorge., Portugal Seeks Balance of Emigration, Immigration. Migration Policy Institute- Migration Information Source. 2002. [cited 2018 01/27]. Available from: <https://www.migrationpolicy.org/article/portugal-seeks-balance-emigration-immigration>.
15. Barros H., Teixeira C., Montenegro N., Rodrigues T., Carrapatoso M., Marques A.R. Protocolo de estudo - Saúde Perinatal em Migrantes: Barreiras, Incentivos e Resultados. 2017 : Instituto de Saúde Pública da Universidade do Porto.

16. Merry L, Clausen C, Gagnon AJ, Carnevale F, Jeannotte J, Saucier J-F, et al. Improving Qualitative Interviews With Newly Arrived Migrant Women. *Qualitative Health Research*. 2011;21(7):976-86.
17. Archibald M, Munce S. Challenges and Strategies in the Recruitment of Participants for Qualitative Research 2015. 34-7 p.
18. Newington L, Metcalfe A. Factors influencing recruitment to research: qualitative study of the experiences and perceptions of research teams. *BMC Medical Research Methodology*. 2014;14:10-.
19. Page SA, Nyeboer J. Improving the process of research ethics review. *Research Integrity and Peer Review*. 2017;2(1):14.
20. Sullivan-Bolyai S, Bova C, Deatrick JA, Knafk K, Grey M, Leung K, et al. Barriers and strategies for recruiting study participants in clinical settings. *Western journal of nursing research*. 2007;29(4):486-500.
21. Twamley K, Puthussery S, Macfarlane A, Harding S, Ahmed S, Mirsky J. Recruiting UK-born ethnic minority women for qualitative health research—lessons learned from a study of maternity care 2009. 25-38 p.
22. Ahlmark N, Algren MH, Holmberg T, Norredam ML, Nielsen SS, Blom AB, et al. Survey nonresponse among ethnic minorities in a national health survey—a mixed-method study of participation, barriers, and potentials. *Ethnicity & health*. 2015;20(6):611-32.
23. DEDING, Mette; FRIDBERG, Torben; JAKOBSEN, Vibeke. Non-response in a survey among immigrants in Denmark. *Survey Research Methods*, [S.l.], v. 2, n. 3, p. 107-121, dec. 2008. ISSN 1864-3361. doi:<http://dx.doi.org/10.18148/srm/2008.v2i3.98>. [cited 2018 08/24]. Available from: <https://ojs.ub.uni-konstanz.de/srm/article/view/98>.
24. Merry L, Low A, Carnevale F, Gagnon AJ. Participation of childbearing international migrant women in research: the ethical balance. *Nursing ethics*. 2016;23(1):61-78.
25. Neufeld A, Harrison MJ, Hughes KD, Spitzer D, Stewart MJ. Participation of Immigrant Women Family Caregivers in Qualitative Research. *Western journal of nursing research*. 2001;23(6):575-91.
26. Carley-Baxter LR, Peytchev A, Black MC. Comparison of Cell Phone and Landline Surveys: A Design Perspective. *Field Methods*. 2010;22(1):3-15.
27. Axinn WG, Link CF, Groves RM. Responsive survey design, demographic data collection, and models of demographic behavior. *Demography*. 2011;48(3):1127-49.
28. Brady T, Paradata in Survey Research, West Institution: University of Michigan August, 2011: Vol. 4, Issue 4, 10.29115/SP-2011-0018 [cited 2018 08/23]. Available from: <http://www.surveypactice.org/article/3036-paradata-in-survey-research>.
29. Durrant GB, D'Arrigo J, Steele F. Analysing interviewer call record data by using a multilevel discrete time event history modelling approach. *Journal of the Royal Statistical Society Series A (Statistics in Society)*. 2013;176(1):251-69.
30. Drabble L, Trocki KF, Salcedo B, Walker PC, Korcha RA. Conducting qualitative interviews by telephone: Lessons learned from a study of alcohol use among sexual minority and heterosexual women. *Qualitative social work : QSW : research and practice*. 2016;15(1):118-33.
31. The Causes and Consequences of Response Rates in Surveys by the News Media and Government Contractor Survey Research Firms. *Advances in Telephone Survey Methodology*.
32. Public Services and Procurement Canada, Stage 2: Data collection. [updated 19/11/2014; cited 2018 08/24]. Available from: <http://www.tpsgc-pwgsc.gc.ca/rop-por/rappports-reports/telephone/etape-stage-02-eng.html>.
33. Mindell JS, Giampaoli S, Goesswald A, Kamtsiuris P, Mann C, Männistö S, et al. Sample selection, recruitment and participation rates in health examination surveys in Europe – experience from seven national surveys. *BMC Medical Research Methodology*. 2015;15(1):78.
34. Vicente P., Marques C. & Reis E. (2017). Effects of call patterns on the likelihood of contact and of interview in mobile CATI surveys. Retrieved from <https://surveyinsights.org/?p=9044>.

## Tables and Figures

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**Figure 1:** Flowchart of the invited women in the maternity units of the public hospitals in Portugal and of the events resulting from the phone contacts by the interviewers



**Table 3: Identified languages in the project baMBINO with the types of translator used until July 2018**

<b>Identified languages</b>	<b>Translator</b>
Creole- Guinea Bissau	Interviewer of the team
Creole- Cape Verde	Hired freelance translator
Spanish	Interviewer of the team
Russian	Interviewer of the team
Ukrainian	Interviewer of the team
English	Interviewer of the team
Arabic	Interviewer of the team
Nepali	Volunteer interviewer
Chinese	Hired freelance translator and National High Commissioner for Migrations
Bengali	Volunteer interviewer
Romanian	Hired freelance translator
Bulgarian	Hired freelance translator and National High Commissioner for Migrations
Fula- Guinea Bissau	National High Commissioner for Migrations
Tigrinya	National High Commissioner for Migrations
Lingala	National High Commissioner for Migrations
Mandiga	National High Commissioner for Migrations
Hindi	Volunteer interviewer and National High Commissioner for Migrations
Italian	Volunteer interviewer
Urdu	Volunteer interviewer
Punjabi	Volunteer interviewer
German	Interviewer of the team
French	Interviewer of the team

**Table 4: Socio-demographic characteristics of women who accepted to participate in the maternity units and those with results from the phone contacts until 25<sup>th</sup> July 2018**

		n (%) or mean± standard deviation			
		Women who accepted to participate (recruitment) n=4929	Women who began the phone interview n=2806	Missing contact or phone contact without success n=1582	Women who refused phone interview n=151
Age (years)		30.4±5.86	31.0±5.74	29.5±5.85	30.0±6.91
					<b>p&lt;0.001</b>
Maternal country of birth	Portugal	2175 (44.1)	1270 (45.3)	674 (42.6)	67 (44.4)
	PSAC	1373 (27.9)	690 (24.6)	530 (33.5)	38 (25.2)
	Middle East and North Africa	25 (0.5)	17 (0.6)	5 (0.3)	2 (1.3)
	Sub-Saharan Africa	78 (1.6)	39 (1.4)	28 (1.8)	2 (1.3)
	Brazil	487 (9.9)	308 (11.0)	129 (8.2)	11 (7.3)
	Latin American and Caribbean	86 (1.7)	57 (2.0)	22 (1.4)	2 (1.3)
	Western Europe	240 (4.9)	151 (5.4)	65 (4.1)	6 (4.0)
	Eastern Europe and Central Asia	292 (5.9)	203 (7.2)	66 (4.2)	10 (6.6)
	South Asia	80 (1.6)	39 (1.4)	26 (1.6)	4 (2.6)
	East Asia and Pacific	50 (1.0)	21 (0.7)	15 (0.9)	7 (4.6)
	North America	16 (0.3)	11 (0.4)	4 (0.3)	0 (0.0)
	Missing	27 (0.5)	0	18 (1.1)	2 (1.3)
					<b>p&lt;0.001</b>
Portuguese region where women was recruited	Norte	811 (16.5)	565 (20.1)	174 (11.0)	21 (13.9)
	Centro	460 (9.3)	340 (12.1)	85 (5.4)	6 (4.0)
	Lisboa e Vale do Tejo	3358 (68.1)	1695 (60.4)	1243 (78.6)	119 (78.8)
	Alentejo	9 (0.2)	*	*	*
	Algarve	291 (5.9)	206 (7.3)	79 (5.0)	5 (3.3)
					<b>p&lt;0.001</b>

		n (%) or mean± standard deviation			
		Women who accepted to participate (recruitment) n=4929	Women who began the phone interview n=2806	Missing contact or phone contact without success n=1582	Women who refused phone interview n=151
Education level (school years)	Up to 9 <sup>th</sup>	1484 (30.1)	796 (28.4)	511 (32.3)	76 (50.3)
	10 <sup>th</sup> – 12 <sup>th</sup>	1805 (36.6)	1011 (36.0)	596 (37.7)	42 (27.8)
	>12 <sup>th</sup>	1594 (32.3)	996 (35.5)	442 (27.9)	29 (19.2)
	Missing	46 (0.9)	3 (0.1)	33 (2.1)	4 (2.6)
<b>p&lt;0.001</b>					
Marital status	With companion	3497 (70.9)	2044 (72.8)	1073 (67.8)	107 (70.9)
	With no companion	1402 (28.4)	762 (27.2)	486 (30.7)	42 (27.8)
	missing	30 (0.6)	0	23 (1.5)	2 (1.3)
<b>p=0.047</b>					
Parity	primiparous	2191 (44.5)	1344 (47.9)	636 (40.2)	54 (35.8)
	multiparous	2616 (53.1)	1451 (51.7)	865 (54.7)	94 (62.3)
	missing	122 (2.5)	11 (0.4)	81 (5.1)	3 (2.0)
<b>p=&lt;0.001</b>					

**Table 5: Explicative model of the women which initiated the interview until 25<sup>th</sup> July 2018**

Variables		OR (95% CI)	p-value
Age (years)		1.05 (1.04-1.07)	<0.001
Maternal country of birth	Portugal	1	
	PSAC	0.90 (0.77-1.04)	0.155
	Middle East and North Africa	1.18 (0.46-3.03)	0.730
	Sub-Saharan Africa	0.94 (0.56-1.57)	0.815
	Brazil	1.21 (0.96-1.53)	0.107
	Latin American and Caribbean	0.92 (0.54-1.57)	0.759
	Western Europe	0.78 (0.57-1.08)	0.130
	Eastern Europe and Central Asia	1.47 (1.09-1.98)	0.011
	South Asia	0.86 (0.51-1.45)	0.575
	East Asia and Pacific	0.57 (0.31-1.07)	0.082
	North America	0.81 (0.25-2.64)	0.723
Regions of Portugal	North	1	
	Center	1.25 (0.94-1.68)	0.128
	Lisbon	0.49 (0.40-0.59)	<0.001
	Algarve	0.93 (0.67-1.27)	0.637
Education level	Up to 9th	1	
	10th – 12th	1.03 (0.88-1.20)	0.748
	>12th	1.08 (0.91-1.28)	0.386
Parity	Primiparous	1	
	Multiparous	0.66 (0.57-0.76)	<0.001



**Table 6: Mean number of phone contacts among all women with completed interview until 25<sup>th</sup> July 2018**

<b>Maternal country of birth</b>	<b>mean ± standard deviation</b>
Portugal	3.4±2.54
PSAC	3.5±2.71
Middle East and North Africa	2.6±1.89
Sub-Saharan Africa	3.3±2.06
Brazil	3.7±2.64
Latin American and Caribbean	3.2±2.35
Western Europe	4.2±2.93
Eastern Europe and Central Asia	3.3±2.41
South Asia	3.2±2.80
East Asia and Pacific	4.1±2.78
North America	3.9±2.30
	<b>p=0.040</b>

## Supplementary Material

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**Table 1: Waiting time between the submission of baMBINO project to the EC of the hospitals and the beginning of the recruitment**

Hospitals (n=39)	Director decision	Submission to the EC	Waiting time for approval (months)	EC reply	EC decision	Date of the first delivery reported	Time-delay Approval by EC - 1 <sup>st</sup> delivery reported (months)	Time-delay submission to the EC - 1 <sup>st</sup> delivery reported (months)	Time-period of recruitment (months)
A	1	16/03/2017	4.2	21/07/2018	1	09/09/2017	1.7	5.9	11
B	1	26/01/2017	0.6	13/02/2017	1	11/06/2017	3.9	4.5	14
C	1	28/03/2017	0.4	10/04/2017	1	04/07/2017	2.8	3.2	13
D	1	31/03/2017	1.1	02/05/2017	1	03/04/2017	0.0	0.1	16
E	1	21/03/2017	2.7	09/06/2017	1	25/06/2017	0.5	3.2	13
F	1	22/03/2017	5.6	06/09/2017	1	16/10/2017	1.3	6.9	9
G	1	07/02/2017	1.9	04/04/2017	1	22/06/2017	2.6	4.5	13
H	1	13/02/2017	0.3	22/02/2017	1	13/05/2017	2.7	3.0	15
I	1	22/03/2017	5.6	06/09/2017	1	17/10/2017	1.4	7.0	9
J	1	20/03/2017	1.9	16/05/2017	1	14/06/2017	1.0	2.9	14
K	0								
L	1	23/03/2017	0.3	31/03/2017	1	04/06/2017	2.2	2.5	14
M	1	26/04/2017	1.4	18/05/2017	1	19/06/2017	1.1	2.5	13
N	1	03/03/2017	2.5	16/05/2017	1	01/05/2017	0.0	2.0	15

Hospitals (n=39 )	Director decision	Submission to the EC	Waiting time for approval (months)	EC reply	EC decision	Date of the first delivery reported	Time-delay Approval by EC - 1 <sup>st</sup> delivery reported (months)	Time-delay submission to the EC - 1 <sup>st</sup> delivery reported (months)	Time-period of recruitment (months)
O	1	28/03/2017	10.5	07/02/2018	1	04/04/2018	1.9	12.4	4
P	1	01/02/2017	2.4	13/04/2017	1	05/06/2017	1.8	4.2	14
Q	0								
R	1	27/02/2017	2.2	05/05/2017	1	02/09/2017	4	6.2	11
S	1	13/02/2017	2.6	02/05/2017	1	30/05/2017	0.9	3.5	14
T	1	13/02/2017	2.6	03/05/2017	1	09/05/2017	0.2	2.8	15
U	1	31/03/2017	1.1	02/05/2017	1	27/05/2017	0.8	1.9	14
V	1	24/03/2017	2.2	29/05/2017	1	05/06/2017	0.2	2.4	14
W	1	28/03/2017	1.2	02/05/2017	1	23/05/2017	0.7	1.9	14
X	1	28/04/2017	1.5	12/06/2017	1	07/07/2017	0.8	2.3	13
Y	1	15/02/2017	4.2	21/06/2017	1	03/08/2017	1.4	5.6	12
Z	1	23/02/2017	2.5	10/05/2017	0				
AA	1	24/02/2017	4.6	12/07/2017	1	19/07/2017	0.2	4.8	12
AB	1	21/02/2017	2.2	28/04/2017	1	04/09/2017	4.3	6.5	11
AC	1	23/03/2017	2.3	31/05/2017	1	24/08/2017	2.8	5.1	11
AD	1	27/03/2017	0.7	17/04/2017	1	23/05/2017	1.2	1.9	14

Hospitals (n=39 )	Director decision	Submission to the EC	Waiting time for approval (months)	EC reply	EC decision	Date of the first delivery reported	Time-delay Approval by EC - 1 <sup>st</sup> delivery reported (months)	Time-delay submission to the EC – 1 <sup>st</sup> delivery reported (months)	Time-period of recruitment (months)
AE	1	31/03/2017	1.6	19/05/2017	1	06/06/2017	0.6	2.2	14
AG	1	31/03/2017	1.3	08/05/2017	1	15/05/2017	0.2	1.5	15
AH	1	31/03/2017		Waiting for a response					
AI	1	27/02/2017	1.0	28/03/2017	1	05/08/2017	4.3	5.3	12
AJ	1	09/05/2017	2.9	04/08/2017	1	17/08/2017	0.4	3.3	11
AK	1	14/02/2017	11.0	10/01/2018	1	No deliveries reported			
AL	1	25/07/2017		Waiting for a response					
AM	1	28/03/2017	2.2	02/06/2017	1	16/01/2018	7.6	9.8	6
AN	0								
Average			2.7				1.7	4.1	12.5
Standard deviation			±2.49				±1.67	±2.54	±2.51

**Table 2:** Expected number of deliveries per week by hospital (only hospitals which accepted to participate)

Hospital	Reported by focal points for the week 22 <sup>nd</sup> -28 <sup>th</sup> May 2017		Expected number of recruited women (/week)	Real number of recruited women(/week)	Difference between the real and the expected number of recruited women (/week)
	Total deliveries (/week)	Deliveries among migrant (/week)			
A	9	0	0	1.0	1.0
B	76	24	48	2.1	-45.9
C	25	0	0	1.1	1.1
D	12	6	12	3.8	-8.2
E	28	2	4	1.0	-3.0
F	55	0	0	0.3	0.3
G	50	1	2	0.6	-1.4
H	52	2	4	2.1	-1.9
I	46	2	4	1.5	-2.5
J	72	5	10	1.4	-8.6
L	24	0	0	1.5	1.5
M	49	12	24	0.8	-23.2
N	47	22	44	38.0	-6.0
O	23	1	2	1.0	-1.0

Hospital	Reported by focal points for the week 22 <sup>nd</sup> -28 <sup>th</sup> May 2017		Expected number of recruited women per week	Real number of recruited women per week	Difference between the real and the expected number of recruited women per week
	Deliveries reported per week	Deliveries among migrant per week			
P	43	2	4	1.5	-2.5
R	*	*	*	1.9	*
S	22	0	0	0.9	0.9
T	48	1	2	2.9	10.9
U	*	14	28	1.8	-26.2
V	10	2	4	0.3	-43.7
W	35	1	2	0.5	-1.5
X	24	5	10	1.7	-8.3
Y	32	3	6	1.1	-4.9
AA	39	5	10	2.1	-7.9
AB	*	*	*	0.1	*
AC	6	0	0	0.8	0.8
AD	*	*	*	5.6	*
AE	16	2	4	0.9	-3.1
AG	*	*	*	1.3	*

Hospital	Reported by focal points for the week 22 <sup>nd</sup> -28 <sup>th</sup> May 2017		Expected number of recruited women per week	Real number of recruited women per week	Difference between the real and the expected number of recruited women per week
	Deliveries reported per week	Deliveries reported per week			
AI	23	3	6	0.5	-5.5
AJ	*	*	*	2.1	*
AK	*	*	*		
AM	*	*	*	7.5	*
Total			230	90	

\*The focal point did not reply of the request of providing data during one week regarding the total of deliveries and the deliveries occurring by migrants.



## 4.) Conclusion

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The interest to conduct this research was to assess the challenges which might occur in the implementation of a research project, providing knowledge when planning future national surveys. We observed time-delays during each step of the implementation process and troubles in achieving the expected sample size. When planning data collection through CATI, researchers should be aware of missing phone contact and unsuccessful attempt of phone contact that could have a negative impact in the representativeness of the sample.

Implementation of a project is an important step regarding research. To enhance the effectiveness of an implementation process, it is necessary to acquire evidence based on challenges which might appear and strategies that might be successful. Several reasons could have an impact on the planned study design such as the one cited above. Although, some factors are recognizing to affect the participation among migrant women. Moreover, this study demonstrated that through adapted strategies participation of migrants could be increased. However, costs and benefits associated with the strategies need to be balanced, reaching the most cost-effective strategies in the research. Therefore, the importance of reporting challenges which appeared during the implementation process of a research. As mention CATI offers some advantages for research nevertheless, obstacles related for reaching a participant by phone has been shown. Moreover, differences have been stated between participants according to these outcomes in regards to their socio-demographic characteristics. Based on these characteristics, the final sample of participants didn't match with the expected one.

This study will support future research enrolling public hospitals in mainland Portugal in regards the implementation and recruitment process. Furthermore, this study spotlighted the relevance on the collection of accurate phone contacts enabling the conduction of phone interviews since that the absence of contact or the unsuccessful contact attempts have a significant impact on time and costs for the project. Those obstacles need to be highlighted to enhance strategies regards CATI, increasing the effectiveness of the use of such a method in research.

In overall to rise the efficiency and efficacy of a research project, challenges and strategies should be reported regarding the implementation and recruitment process to avoid them in future research. In this way, reported strategies might enable decisions based on evidence in regards to future design. Emphasizing the relevance of future research to understand and identify aspects which might influence the implementation and recruitment process on migrant's women into a national survey related to perinatal health.

## 5.) References

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1. United Nations, Department of Economic and Social Affairs PD. Recommendations on Statistics of International Migration. Revision 1. Vol. 58. United Nations. 1998 : p. 1–95. [cited 2017 12/20]. Available from: [https://unstats.un.org/unsd/publication/SeriesM/SeriesM\\_58rev1e.pdf](https://unstats.un.org/unsd/publication/SeriesM/SeriesM_58rev1e.pdf).
2. IOM. World Migration Report 2018. World Migration Report. 2018 : p.184.
3. World Health Organization Europe. Toolkit for assessing health system capacity to manage large influxes of refugees, asylum-seekers and migrants. 2016 : p.62. [cited 2017 12/22]. Available from: [http://www.euro.who.int/\\_data/assets/pdf\\_file/0018/325611/Toolkit-assessing-HS-capacity-manage-large-influxes-refugees-asylum-seekers-migrants.pdf](http://www.euro.who.int/_data/assets/pdf_file/0018/325611/Toolkit-assessing-HS-capacity-manage-large-influxes-refugees-asylum-seekers-migrants.pdf).
4. Lemaitre G. The Comparability of International Migration Statistics: Problems and Prospects. Stat Br OECD No 9 . 2005. [cited 2017 12/21]. Available from: [http://www.oecd.org/document/29/0,3343,en\\_2649\\_33931\\_36065117\\_1\\_1\\_1\\_37415,00.html](http://www.oecd.org/document/29/0,3343,en_2649_33931_36065117_1_1_1_37415,00.html).
5. United Nations. International Migration Report 2017. United Nations. 2017 : p.1–21. [cited 2017 12/21]. Available from: <http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017.pdf>.
6. United Nations, Department of Economic and Social Affairs PD. International Migration Report 2017. 2017 : p.4-17. [cited 2017 12/21]. Available from: [http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017\\_Highlights.pdf](http://www.un.org/en/development/desa/population/migration/publications/migrationreport/docs/MigrationReport2017_Highlights.pdf).
7. Serviço de Estrangeiros e Fronteiras. Relatório de Imigração Fronteiras e Asilo 2017. 2018. [cited 2018 01/20]. Available from: <https://sefstat.sef.pt/Docs/Rifa2017.pdf>.
8. Malheiros Jorge. Portugal Seeks Balance of Emigration, Immigration. Migration Policy Institute- Migration Information. 2002. [cited 2018 01/27]. Available from: <https://www.migrationpolicy.org/article/portugal-seeks-balance-emigration-immigration>.
9. Instituto Nacional de Estatística .Nados-vivos (N.º) por Local de residência da mãe (NUTS - 2013) e Nacionalidade da mãe. Anual. 2017. [cited 2018 06/21]. Available from: [https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine\\_indicadores&indOcorrCod=0008087&contexto=bd&selTab=tab2](https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&indOcorrCod=0008087&contexto=bd&selTab=tab2).
10. Instituto Nacional De Estatística. População estrangeira que solicitou estatuto de residente (N.º) por Local de residência (NUTS - 2013), Sexo e Nacionalidade. Anual. 2016. [cited 2018 06/21]. Available from: [https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine\\_indicadores&indOcorrCod=0008627&contexto=bd&selTab=tab2](https://www.ine.pt/xportal/xmain?xpid=INE&xpgid=ine_indicadores&indOcorrCod=0008627&contexto=bd&selTab=tab2).
11. IOM, WHO, UN. International Migration, Health and Human rights. 2013 : p. 64. [cited 2017 10/12]. Available from: [http://www.ohchr.org/Documents/Issues/Migration/WHO\\_IOM\\_UNOHCHRPublication.pdf](http://www.ohchr.org/Documents/Issues/Migration/WHO_IOM_UNOHCHRPublication.pdf).
12. Nonnenmacher S, Naik A, Chappel L. MAINSTREAMING MIGRATION into Development planning: A handbook for policy-makers and practitioners. 2010 : p.148.
13. Boerleider AW, Wiegers TA, Mannien J, Francke AL, Deville WL. Factors affecting the use of prenatal care by non-western women in industrialized western countries: a systematic review. BMC Pregnancy Childbirth. 2013;13:81.
14. Padilla B, Pereira M. Health and Migration in the EU: building a shared vision for action. Challenges Heal age Migr Heal Migr Eur Union [Internet]. 2007;1–19.
15. United Nations. Transforming our world: the 2030 Agenda for Sustainable Development. Gen Assem 70 Sess. 2015;16301(October):1–35.
16. United Nations Population Fund. Topics- Migration- Overview. Updated:2015. [cited 2017 10/12] Available from: <https://www.unfpa.org/migration>.
17. Machado M.C.,Pereira F., Machaqueiro S., Approaches to migrant health in Portugal., Eurohealth Vol 16 No 1. 2010 : p.30-31. [cited 2017 10/12]. Available from: <http://www.lse.ac.uk/LSEHealthAndSocialCare/pdf/eurohealth/VOL16No1/Machado.pdf>.

18. Pierre Chauvin, Isabelle Parizot, Nathalie Simonnot. Access to healthcare for undocumented migrants in 11 European countries. Médecins du Monde European observatory on access to healthcare. Médecins du Monde. 2009 : p.154.
19. Bischoff Alexander. Caring for migrant and minority patients in European hospitals - A review of effective interventions. Swiss Forum for Migration and Population studies., Institut auprès de l'Université de Neuchâtel. 2003.
20. Council of Ministers. Plan for Immigrant Integration. Council of Ministers Resolution No. 63-A/2007. Lisbon: High Commission for Immigration and Intercultural Dialogue. 2007.
21. Council of Ministers. II Plan for Immigrant Integration 2010-2013. Resolution of the Council of Ministers No. 74/2010 . Official Journal of the Republic, Series 1, NO. 182 of 17 September 2010 : p. 64.
22. Alto Comissariado para as migrações, Strategic Plan for Migration 2015-2010, Resolution of the Council of Ministers No. 12-B/2015, ON 20 MARCH : p. 65.
23. Calouste Gulbenkian Foundation. A Future for Health- Gulbenkian Platform for a Sustainable Health System. 2017. [cited 2018 02/11]. Available from: <https://gulbenkian.pt/en/project/a-future-for-health/>.
24. Bradby H, Humphris R, Newall D, Phillimore J. Public health aspects of migrant health: a review of the evidence on health status for refugees and asylum seekers in the European Region. Copenhagen: WHO Regional Office for Europe; (Health Evidence Network synthesis report 44). 2015:33.
25. Mujica-Martorell, Gabriela, "Assessment of Migrant Health and Health Disparities between Immigrants and Swiss Nationals Living in Switzerland" (2012). Independent Study Project (ISP) Collection. 1476
26. Stronks K, Ravelli AC, Reijneveld SA. Immigrants in the Netherlands: equal access for equal needs? J Epidemiol Community Health 2001;55:701-7.
27. World Health Organization., International Organization for Migration., Government from Spain - Ministerie of Health., Health of Migrants- The Way Forward., Report of a Global Consultation Madrid, Spain,3-5. March 2010 : p. 112 [cited 2017 12/10]. Available from: [http://www.who.int/hac/events/consultation\\_report\\_health\\_migrants\\_colour\\_web.pdf](http://www.who.int/hac/events/consultation_report_health_migrants_colour_web.pdf).
28. Sarría-Santamera A, Hijas-Gómez AI, Carmona R, Gimeno-Feliú LA. A systematic review of the use of health services by immigrants and native populations. Public Health Reviews. 2016;37(1):28.
29. Brzoska P. Disparities in health care outcomes between immigrants and the majority population in Germany: A trend analysis, 2006–2014. PLOS ONE. 2018;13(1):e0191732.
30. United Nations, United Nations Human Rights- Office of the High Commissioner. Recommended Principles and Guidelines on Human Rights at International Borders. 2014.
31. Balaam MC, Akerjordet K, Lyberg A, Kaiser B, Schoening E, Fredriksen AM, et al. A qualitative review of migrant women's perceptions of their needs and experiences related to pregnancy and childbirth. Journal of advanced nursing. 2013;69(9):1919-30.
32. Chiavarini M, Lanari D, Minelli L, Pieroni L, Salmasi L. Immigrant mothers and access to prenatal care: evidence from a regional population study in Italy. BMJ Open. 2016;6(2):e008802.
33. Posthumus AG, Borsboom GJ, Poeran J, Steegers EAP, Bonsel GJ. Geographical, Ethnic and Socio-Economic Differences in Utilization of Obstetric Care in the Netherlands. PLOS ONE. 2016;11(6):e0156621.
34. Bollini P, Pampallona S, Wanner P, Kupelnick B. Pregnancy outcome of migrant women and integration policy: A systematic review of the international literature. Social Science & Medicine. 2009;68(3):452-61.
35. Essen B, Bodker B, Sjoberg NO, Langhoff-Roos J, Greisen G, Gudmundsson S, et al. Are some perinatal deaths in immigrant groups linked to suboptimal perinatal care services? Bjog. 2002;109(6):677-82.

36. Zwart JJ, Jonkers MD, Richters A, Ory F, Bloemenkamp KW, Duvekot JJ, et al. Ethnic disparity in severe acute maternal morbidity: a nationwide cohort study in the Netherlands. *Eur J Public Health*. 2011;21(2):229-34.
37. Gabriele C, Silva LM, Arends LR, Raat H, Moll HA, Hofman A, et al. Early respiratory morbidity in a multicultural birth cohort: the Generation R Study. *European Journal of Epidemiology*. 2012;27(6):453-62.
38. Machado M-C, Santana P, Helena Carreiro M, Nogueira H, Rosalina Barroso M, Dias A. Iguais ou diferentes? Cuidados de saúde materno-infantil a uma população de imigrantes. 2006.
39. Teixeira C, Correia S, Victora CG, Barros H. The Brazilian Preference: Cesarean Delivery among Immigrants in Portugal. *PLOS ONE*. 2013;8(3):e60168.
40. Wolff H, Epiney M, Lourenco AP, Costanza MC, Delieutraz-Marchand J, Andreoli N, et al. Undocumented migrants lack access to pregnancy care and prevention. *BMC Public Health*. 2008;8(1):93.
41. Agu J, Lobo R, Crawford G, Chigwada B. Migrant Sexual Health Help-Seeking and Experiences of Stigmatization and Discrimination in Perth, Western Australia: Exploring Barriers and Enablers. *International Journal of Environmental Research and Public Health*. 2016;13(5):485.
42. Higginbottom GMA, Morgan M, Alexandre M, Chiu Y, Forgeron J, Kocay D, et al. Immigrant women's experiences of maternity-care services in Canada: a systematic review using a narrative synthesis. *Systematic reviews*. 2015;4(1):13.
43. Dias S.,Gama A.,Rocha C. Immigrant women's perceptions and experiences of health care services: Insights from a focus group study. *Journal of Public Health, Springer Verlag*, 2010, 18(5). p.489-496.
44. Ahmed A, Stewart DE, Teng L, Wahoush O, Gagnon AJ. Experiences of immigrant new mothers with symptoms of depression. *Archives of women's mental health*. 2008;11(4):295-303.
45. Stewart DE, Gagnon A, Saucier JF, Wahoush O, Dougherty G. Postpartum depression symptoms in newcomers. *Canadian journal of psychiatry Revue canadienne de psychiatrie*. 2008;53(2):121-4.
46. Hector Cebolla-Boado.,Leire Salazar., Differences in perinatal health between immigrant and native- origin children: Evidence from differentials in birth weight in Spain.,*Research Article- Demographic Research: Volume 35, Article 7*. 2016 : p.167-200.
47. Hummer RA, Powers DA, Pullum SG, Gossman GL, Frisbie WP. PARADOX FOUND (AGAIN): INFANT MORTALITY AMONG THE MEXICAN-ORIGIN POPULATION IN THE UNITED STATES. *Demography*. 2007;44(3):441-57.
48. Carlos Varea, Cristina Bernis, and Antonio González González, "Maternal Characteristics and Temporal Trends in Birth Outcomes: Comparison between Spanish and Migrant Mothers," *International Journal of Population Research*, vol. 2012, Article ID 412680, 8 pages, 2012.
49. Bediako PT, BeLue R, Hillemeier MM. Immigrant Generational Status and Developmental Problems among Prematurely Born Children. *Journal of Immigrant and Minority Health*. 2017.
50. Gagnon AJ, Zimbeck M, Zeitlin J, Alexander S, Blondel B, Buitendijk S, et al. Migration to western industrialised countries and perinatal health: a systematic review. *Social science & medicine (1982)*. 2009;69(6):934-46.
51. Alvarez-Nieto C, Pastor-Moreno G, Grande-Gascón ML, Linares-Abad M. Sexual and reproductive health beliefs and practices of female immigrants in Spain: a qualitative study. *Reproductive Health*. 2015;12:79.
52. Allin S, Mossialos E, eds. *Portugal Health System Review.: European Observatory on Health Systems and Policies*. 2007.
53. Ádány R ., Agudelo-Suárez A., Agyemang ., et. al., *European Observatory on Health Systems and Policies Series- Migration and health in the European Union*. 2011.
54. *International Organization for Migration., Maternal and Child Healthcare for Immigrant Populations*. 2009.

55. European Union Health Programme., Project Management in Public Health in Europe., European Union. [press release]. 2011.
56. Barros H., Teixeira C., Montenegro N., Rodrigues T., Carrapatoso M., Marques A.R., Protocolo de estudo - Saúde Perinatal em Migrantes: Barreiras, Incentivos e Resultados. 2017 : Instituto de Saúde Pública da Universidade do Porto.
57. Thornton T.N. CCA, Dahlberg L.L., et. all. Youth Violence Prevention: A sourcebook for community action. New York: Nove Science Publisher. 2006 : p. 194.
58. Gyapong M., Kamau E., Najjemba R., et. al. Implementation research toolkit. World Health Organization on behalf of the Special Programme for Research and Training in Tropical Diseases. 2014 [cited 2017 09/18]. Available from: <http://www.who.int/tdr/publications/year/2014/ir-toolkit-manual/en/>.
59. Gagnon AJ, DeBruyn R, Essén B, Gissler M, Heaman M, Jeambey Z, et al. Development of the Migrant Friendly Maternity Care Questionnaire (MFMQC) for migrants to Western societies: an international Delphi consensus process. *BMC Pregnancy and Childbirth*. 2014;14(1):200.
60. Cox JL, Holden JM, Sagovsky R. Detection of postnatal depression. Development of the 10-item Edinburgh Postnatal Depression Scale. *The British journal of psychiatry : the journal of mental science*. 1987;150:782-6.
61. Wisner KL, Parry BL, Piontek CM. Clinical practice. Postpartum depression. *The New England journal of medicine*. 2002;347(3):194-9.
62. Watson DP, Adams EL, Shue S, Coates H, McGuire A, Chesher J, et al. Defining the external implementation context: an integrative systematic literature review. *BMC Health Services Research*. 2018;18(1):209.
63. Patel M, Doku V, Tennakoon L. Challenges in recruitment of research participants 2003. 229 p.
64. Newington L, Metcalfe A. Factors influencing recruitment to research: qualitative study of the experiences and perceptions of research teams. *BMC Medical Research Methodology*. 2014;14:10-.
65. Archibald M, Munce S. Challenges and Strategies in the Recruitment of Participants for Qualitative Research 2015. 34-7 p.
66. OHRPP- Office of the Human Research Protection Program. Guidance and Procedure: Recruitment and Screening Methods and Materials- Recruitment Methods & Materials AAHRPP Elements II.3.C, II.3.D, II.4.A, III.1.E. 2012. [cited 2018 03/03]. Available from: <http://ora.research.ucla.edu/OHRPP/Documents/Policy/5/Recruitment.pdf>.
67. Diaz E, Ortiz-Barreda G, Ben-Shlomo Y, Holdsworth M, Salami B, Rammohan A, et al. Interventions to improve immigrant health. A scoping review. *The European Journal of Public Health*. 2017;27(3):433-9.
68. Berens EM, Reder M, Razum O, Kolip P, Spallek J. Informed Choice in the German Mammography Screening Program by Education and Migrant Status: Survey among First-Time Invitees. *PLoS One*. 2015;10(11):e0142316.
69. Agency for Healthcare Research and Quality, Advancing Excellence in Health Care. [cited 2018 03/02]. Available from: <https://healthit.ahrq.gov/ahrq-funded-projects/emerging-lessons/participant-recruitment-research>.
70. The Special Programme for Research and Training in Tropical Diseases- World Health Organization. Implementation research toolkit. 2014. [cited 2018 09/10]. Available from: <http://www.who.int/tdr/publications/topics/ir-toolkit-brochure-rev2017.pdf>.
71. Hulley S.B., Cummings S.R., Browner W.S., Grady., Newman T.B., *Designing Clinical Research - Fourth Edition : Chapter 3-Choosing the study subjects: Specification, Sampling, and recruitment.*, LIPPINCOTT WILLIAMS & WILKINS, a WOLTERS KLUWER business 2013.
72. Adam Safir, Tamara Black, and Rebecca Steinbach. Using Paradata To Examine The Effects Of Interviewer Characteristics On Survey Responses And Data Quality. The Urban Institute Adam Safir, UI, 2100 M Street NW, Washington, DC 20037, Proceedings of the Annual Meeting of the American Statistical Association, August 5-9, 2001:1;5-5-9. [cited 2018 06/05]. Available from: <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.562.226&rep=rep1&type=pdf>.

73. Axinn WG, Link CF, Groves RM. Responsive survey design, demographic data collection, and models of demographic behavior. *Demography*. 2011;48(3):1127-49.
74. The World Bank- Working for a World Free of Poverty. World Bank Country and Lending Groups. 2018. [cited 2018 06/21]. Available from: <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>



## 6.) Annexes

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**Table 1: Classification of the maternal country of birth. Source adapted from: World Bank Country,2018 (74).**

Geographic area	Maternal country of birth
Middle East and North Africa	United Arab Emirates
	Bahrain
	Djibouti
	Algeria
	Egypt
	Israel
	Iraq
	Iran
	Jordan
	Kuwait
	Lebanon
	Libya
	Morocco
	Oman
	Palestine
	Qatar
	Brazil
East Asia and Pacific	Australia
	China
	Fiji
	Hong Kong
	Indonesia
	Japan
	Cambodia
	Korea (Democratic People's Republic of)
	Korea (Democratic of)
	Laos
	Myanmar
	Mongolia
	Macao
	Malaysia

Geographic area	Maternal country of birth
East Asia and Pacific	New Zealand
	Philippines
	Solomon Islands
	Singapore
	Thailand
	East Timor
	Tonga
	East Timor
	Tuvalu
	Taiwan
	Vietnam
Eastern Europe and Central Asia	Albania
	Armenia
	Azerbaijan
	Bosnia Herzegovina
	Bulgaria
	Belarus
	Czech Republic
	Estonia
	Georgia
	Croatia
	Hungary
	Kazakhstan
	Kyrgyzstan
	Lithuania
	Latvia
	Moldova (Republic of)
	Montenegro
	Macedonia (Former Yugoslav Republic of)
	Poland
	Romania
Serbia	
Russia	
Slovenia	
Slovakia	
Tajikistan	
Turkmenistan	

Geographic area	Maternal country of birth
Eastern Europe and Central Asia	Ukraine
	Uzbekistan
Western Europe	Andorra
	Austria
	Belgium
	Switzerland
	Cyprus
	Germany
	Denmark
	Spain
	Finland
	France
	United Kingdom
	Greece
	Ireland
	Iceland
	Italy
	Liechtenstein
	Luxembourg
	Malta
	Netherlands
Norway	
Sweden	
Turkey	
Latin American and Caribbean	Netherlands Antilles
	Argentina
	Aruba
	Barbados
	Bolivia
	Bahamas
	Belize
	Chile
	Colombia
	Costa Rica
	Cuba
	Dominica
	Dominican Republic
Ecuador	

Geographic area	Maternal country of birth
Latin American and Caribbean	Ecuador
	Grenada
	South Georgia and the South Sandwich Islands
	Guatemala
	Guyana
	Honduras
	Saint Lucia
	Montserrat
	Mexico
	Nicaragua
	Panama
	Peru
	Puerto Rico
	Paraguay
	Suriname
	El Salvador
	United States Minor Outlying Islands
Uruguay	
Saint Vincent and the Grenadines	
Venezuela	
North America	Bermuda
	Canada
	United States
PSAC	Angola
	Cabo Verde
	Guinea-Bissau
	Mozambique
S. Tomé Príncipe	
South Asia	Afghanistan
	Bangladesh
	Bhutan
	India
	Sri Lanka
	Nepal
	Pakistan
Thailand	

Geographic area	Maternal country of birth
Sub-Saharan Africa	Burkina Faso
	Burundi
	Benin
	Botswana
	Congo (Democratic Republic of )
	Central African Republic
	Congo
	Ivory Coast
	Cameroon
	Eritrea
	Ethiopia
	Gabon
	Gambia
	Guinea
	Equatorial Guinea
	Kenya
	Comoros
	Liberia
	Lesotho
	Madagascar
	Mali
	Mauritania
	Malawi
	Namibia
	Niger
	Nigeria
	Rwanda
	Seychelles
Sudan	
Saint Helena	
Sierra Leone	
Senegal	
Somalia	
Swaziland	
Chad	
Togo	
Tanzania (United Republic of)	

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Geographic area	Maternal country of birth
Sub-Saharan Africa	Uganda
	South Africa
	Zambia
	Zimbabwe

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**Table 2:** Hospitals being part of the project accorded to the Portuguese region, until 25<sup>th</sup> July 2018.

Regions	Hospitals
Norte	Centro Hospitalar Entre Douro e Vouga, EPE - Hospital de São Sebastião (Santa Maria da Feira)
	Centro Hospitalar Médio Ave, EPE – Unidade Hospitalar de Famalicão
	Centro Hospitalar Póvoa de Varzim/Vila do Conde, EPE – Hospital da Póvoa de Varzim
	Centro Hospitalar Porto, EPE – Centro Materno-Infantil do Norte
	Centro Hospitalar de São João, EPE – Hospital São João
	Centro Hospitalar Tâmega e Sousa, EPE – Unidade Hospital Padre Américo (Penafiel)
	Centro Hospitalar Trás-os-Montes e Alto Douro, EPE - Hospital de S. Pedro (Vila Real)
	Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE – Unidade I (antigo Hospital Eduardo Santos Silva)
	Unidade Local de Saúde do Alto Minho, EPE - Hospital Santa Luzia (Viana do Castelo)
	Unidade Local de Saúde do Nordeste, EPE - Unidade Hospitalar de Bragança
	Unidade Local de Saúde de Matosinhos, EPE – Hospital Pedro Hispano
	Hospital de Braga Hospital da Senhora da Oliveira Guimarães, EPE
Centro	Centro Hospitalar do Baixo Vouga, EPE - Hospital Infante D. Pedro (Aveiro)
	Centro Hospitalar Cova da Beira, EPE - Hospital Pêro da Covilhã
	Centro Hospitalar de Leiria, EPE - Hospital de Santo André (Leiria)
	Centro Hospitalar Tondela Viseu, EPE - Hospital São Teotónio (Viseu)



Regions	Hospitals
Centro	Centro Hospitalar e Universitário de Coimbra - Maternidade Bissaya Barreto
	Centro Hospitalar e Universitário de Coimbra - Maternidade Dr. Daniel de Matos
	Unidade Local de Saúde de Castelo Branco, EPE - Hospital Amato Lusitano
	Unidade Local de Saúde da Guarda, EPE - Hospital Sousa Martins (Guarda)
Lisboa e Vale do Tejo	Centro Hospitalar do Barreiro Montijo, EPE - Hospital Nossa Senhora do Rosário (Barreiro)
	Centro Hospitalar de Lisboa Central, EPE - Maternidade Dr. Alfredo da Costa
	Centro Hospitalar de Lisboa Norte, EPE – Hospital de Santa Maria
	Centro Hospitalar do Médio Tejo, EPE - Hospital Doutor Manoel Constâncio (Abrantes)
	Centro Hospitalar do Oeste - Hospital Distrital Caldas da Rainha
	Hospital Beatriz Ângelo (Loures)
	Hospital Distrital de Santarém, EPE
	Hospital Garcia de Orta, EPE (Almada)
	Hospital Professor Doutor Fernando da Fonseca, EPE (Amadora)
Hospital de Vila Franca de Xira	
Alentejo	Hospital do Espírito Santo, EPE (Évora)
Algarve	Centro Hospitalar do Algarve, EPE – Hospital de Faro
	Centro Hospitalar do Algarve, EPE – Hospital de Portimão

SEDE ADMINISTRATIVA

FACULDADE DE **MEDICINA**

INSTITUTO DE CIÊNCIAS BIOMÉDICAS ABEL SALAZAR

