



**HAL**  
open science

## Fertility Intensity and Timing

Yoann Doignon, Isabelle Blöss-Widmer, Elena Ambrosetti, Sébastien Oliveau

► **To cite this version:**

Yoann Doignon, Isabelle Blöss-Widmer, Elena Ambrosetti, Sébastien Oliveau. Fertility Intensity and Timing. Population Dynamics in the Mediterranean, Springer International Publishing, pp.63-79, 2023, SpringerBriefs in Population Studies, 978-3-031-37758-7. 10.1007/978-3-031-37759-4\_5. hal-04506292

**HAL Id: hal-04506292**

**<https://amu.hal.science/hal-04506292v1>**

Submitted on 15 Mar 2024

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

# Chapter 5

## Fertility Intensity and Timing



**Abstract** This chapter looks at the comparative evolution of fertility since 1950 through several synthetic indicators of fertility intensity (average number of children per woman) and timing (age at childbearing, all birth ranks combined). The Mediterranean area is still a fairly contrasted area in terms of fertility levels, but the reduction in the gaps between countries has been clear and rapid since the 1970s. Fertility is still relatively high in some Southern and Eastern Mediterranean countries and is decreasing noticeably, while very low levels can be observed on the Northern Shore (Spain, Portugal, Italy, Greece, etc.). The chapter also presents the most probable fertility trends in this region of the world by returning to the underlying hypotheses. Is the hypothesis of a sustainable convergence of fertility at the level of the replacement fertility rate between the shores foreseeable and, if so, over what time horizon?

**Keywords** Total fertility rate · Fertility intensity · Age-specific fertility rate · Fertility timing · Mean age at childbearing · Mediterranean

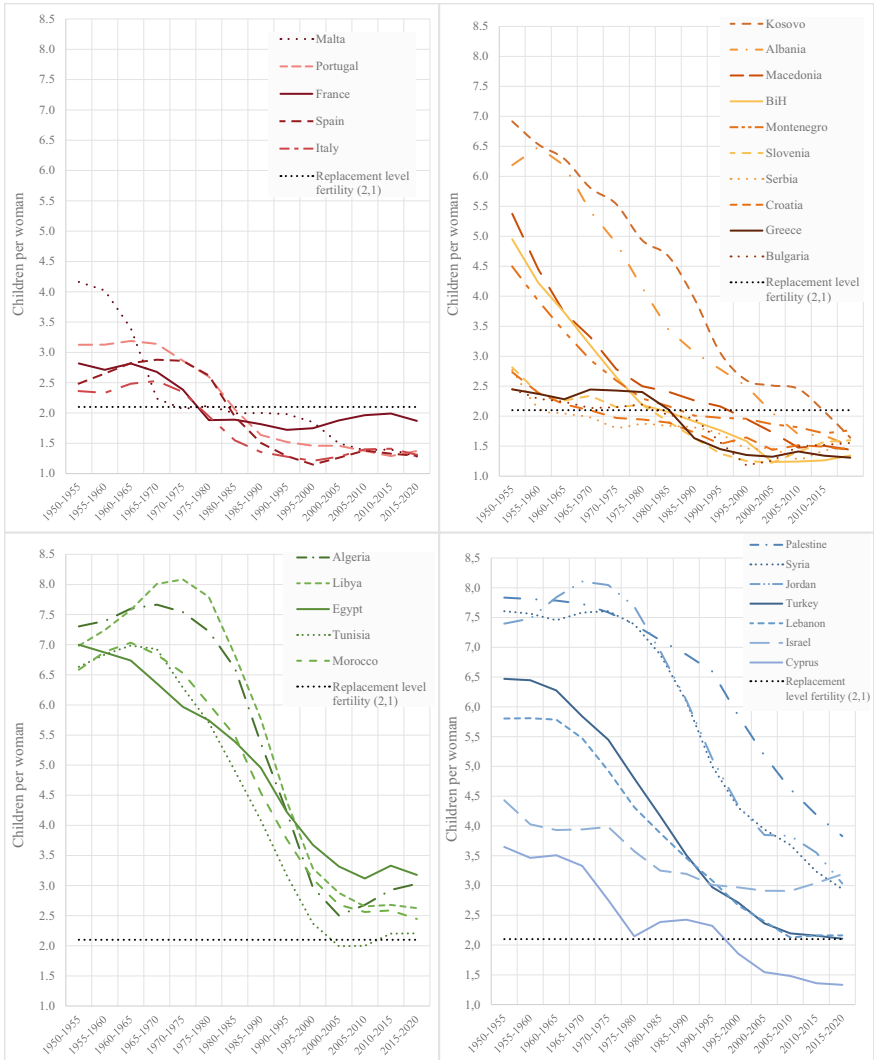
### 5.1 Introduction

This chapter looks at the comparative evolution of fertility since 1950 through several synthetic indicators of fertility intensity (average number of children per woman) and timing (age at childbearing, all birth ranks combined). The Mediterranean area is still a fairly contrasted area in terms of fertility levels, but the reduction in the gaps between countries has been clear and rapid since the 1970s. Fertility is still relatively high in some Southern and Eastern Mediterranean countries and is decreasing noticeably, while very low levels can be observed on the Northern Shore (Spain, Portugal, Italy, Greece, etc.). The chapter also presents the most probable fertility trends in this region of the world by returning to the underlying hypotheses. Is the hypothesis of a sustainable convergence of fertility at the level of the replacement fertility rate between the shores foreseeable and, if so, over what time horizon?

### 5.2 A Global Fertility Convergence

Through the process of demographic transition (see Chap. 4), the Mediterranean countries have seen their fertility decline according to different timing, currently reaching levels lower than in the past (Fig. 5.1).

The fertility gap between the most and least fertile countries has thus fallen from 5.5 children per woman in 1950 to only 2.6 children in 2020. The highest fertility



**Fig. 5.1** Comparative fertility evolution in the Mediterranean (1950–2022) (Source World Population Prospects, 2022)

rates in the 1950s were over 7 children per woman, while the lowest were around 2.4 children per woman, compared to 3.8 and 1.3 children per woman respectively today. In the 1950s, none of the 27 Mediterranean countries had a fertility rate below 2.1 children per woman, a symbolic figure known as the population replacement level, whereas today there are 17. While the countries on the Northern shore were already well advanced in their transition in the 1950s, 1960s and 1970s (see Chap. 4), the countries on the Southern and Eastern shores did not experience a significant or very rapid decline in their fertility until the 1970s, with the exception of Cyprus and Israel, where the decline in fertility began before 1950.

This vast movement of convergence in the fertility between the countries of the Southern and Eastern shores and those of the Northern shore is, however, incomplete, and has occurred “albeit not always smoothly”<sup>1</sup> (Courbage, 1999). Figure 5.1 shows not only the different periods of decline, but also the fact that the majority of countries are now below the replacement level, in contrast to countries that still have relatively high fertility. This fertility rate of between 3 and 4 children per woman can be seen in highly populated countries such as Egypt and Algeria, along with more intermediate-sized states such as Palestine, Jordan and Israel.

While this decline in fertility in the countries of the Southern and Eastern shores had been cautiously envisaged (Seklani, 1960) or more so automatically been announced on account of the “universal” theory of demographic transition (see Chap. 4), other authors<sup>2</sup> did not think that it could be observed in the Arab-Muslim countries. However, with nuances depending on the region, the delay in the age of marriage<sup>3</sup> coupled with the spread of contraception has finally led to a decline in fertility in these countries (Fargues, 1989). At the same time, it was not rejected that this region of the world, plagued by a number of other “misidentified factors”, could deviate from the expected course.<sup>4</sup> Although greatly attenuated today, differences between the behaviour of the populations of the Northern Shore (low fertility) compared to those of the Southern and Eastern shores (on average more fertile) are still clearly visible (Fig. 5.1) and subject to discussion. It should be noted, however, that the fertility of several countries on the Southern and Eastern shores (Cyprus, Lebanon, Turkey, Tunisia, and to a lesser extent Morocco and Libya) has reached levels close to or below the replacement level.

Will the higher fertility rates of Egypt, Morocco, Libya and Israel, which seem to have reached a pseudo-equilibrium, stabilise at a level above 2.1 children per

---

<sup>1</sup> This text has been translated into English by the authors. The original text in French is as follows: “non sans à-coups”.

<sup>2</sup> “Dudley Kirk (1966) was one of the earliest demographers to note that Muslim populations tended to have high fertility, that there was no evidence of decline, and that in a given country, Muslims tended to have higher fertility than adherents of other religions” (Jones, 2006, 250).

<sup>3</sup> See Chap. 6 for an analysis of nuptiality rates and age at marriage.

<sup>4</sup> “The demography of this region escapes, in more than one case, the paradigm of transition which has been imposed as a scheme for explaining demographic change” (Courbage, 1999, 1).

This text has been translated into English by the authors. The original text in French is as follows: “La démographie de cette région échappe, dans plus d’un cas, au paradigme de la transition qui s’est imposé comme schéma d’explication des évolutions démographiques”.

woman? Will fertility rates in the Palestinian Territories, Jordan and Syria fall significantly further? If so, to what level? Or will they remain above 2.1 children per woman? Are trend reversals or sustainable recoveries to be expected, as suggested by recent fertility trends in some countries (e.g. Egypt, Algeria) (Ouadah-Bedidi et al., 2012)? Is it possible to observe a homogenisation of fertility behaviour of all Mediterranean women, regardless of their nationality? Is a fertility rate of 1 or 2 children per woman a sustainable objective throughout the Mediterranean? The Euro-Mediterranean geopolitics (the Israeli-Palestinian conflict, the Syrian, Turkish and Greek situation, and the Balkans, etc.), and the different traditional and/or religious models of union formation (see Chap. 6) and of attachment to the family and to children in Mediterranean societies, lead us to reflect on these past evolutions and to formulate hypotheses on the future evolution of fertility in a singular Mediterranean context.

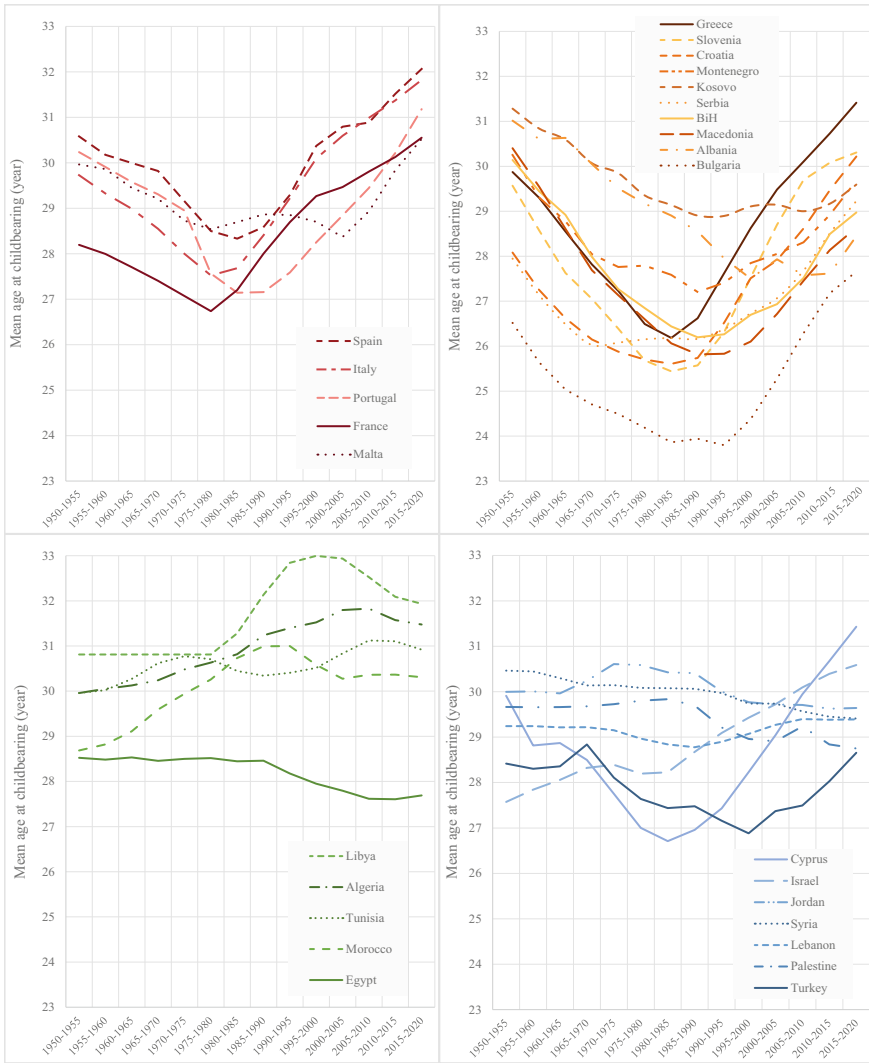
In an attempt to clarify this, an in-depth comparative analysis of indicators of fertility timing (the age at which women have children) and fertility intensity at different ages is carried out successively. It provides a clearer picture of the expected trends in women's fertility in this region of the world by pinpointing the common patterns and highlighting the exceptions.

## 5.3 The Intersection of Birth Timing and Fertility Intensity

### 5.3.1 Mean Age at Childbearing

For a given period, the mean childbearing age is an indicator of when a woman gives birth, through it mixes the behaviour of several different generations. Like any average, it needs to be interpreted carefully and be reconciled with fertility levels. If, however, we describe the evolution of the mean age at childbearing in the Mediterranean since 1950, we will be surprised to see that its value has changed only slightly, from 29.5 years on average in the region to 30 years at present. This overall situation can then be separated in several groups of countries (Fig. 5.2). While some countries show a virtually stable indicator throughout the period, others have experienced a V-shaped (sharp) or U-shaped (gentler) evolution: respectively, a rapid decline in the mean age at childbearing until the mid-1980s, followed by a rapid rise; or a slower decline until the 1990s, followed by a steady rise until the present.

The first group covers 7 countries (Algeria, Morocco, Tunisia, Jordan, Lebanon, Palestine, Syria), where the mean age at childbearing has never fallen significantly over the past 70 years. Two other countries can also be added to this group (Libya, Israel). The mean age in Libya has risen steadily from 30.8 years to 31.9 years today. Stable until the mid-1970s, the increase in age accelerated and stabilised at almost 33 years between 1995 and 2005, before decreasing to what it is now. The mean age in Israel has hardly ever fallen in the last 70 years, but has increased from 27.6 years in the 1950s-1970s to 30.6 years today. The mean childbearing age for this group of



**Fig. 5.2** Mean age at childbearing in the Mediterranean (1950–2019) (Source World Population Prospects, 2022)

countries has remained high (between 28 and 33 years) and fairly constant since 1950 (29.6 years in 1950, 30.3 years in the 1980s, 30.4 years today). They are all located in North Africa and the Near East. In these countries, the contraceptive discontinuation has not led to a reduction in the mean childbearing age, as it has been compensated for by the concomitant postponement of the age at marriage (see Chap. 6). This could mean that contraception is mainly used in these countries once the desired number of children has been reached, as already noted by Fargues (1989). Some of

the countries in this group reach some of the highest levels in the Mediterranean, such as Algeria and Libya, where the mean age at childbearing is currently 31.5 and 31.9 years respectively. However, there is no convergence for these countries towards a single mean age. There is a clear dispersion of the childbearing ages.

The 9 other countries (Greece, France, Spain, Portugal, Slovenia, Montenegro, Italy, Cyprus, Malta) that make up the second group, shows a much earlier and more marked change in the average fertility age (V-shaped curve<sup>5</sup>). These countries are those in which contraceptive discontinuation has led to a reduction in the mean age at childbearing, as fewer unplanned births have been occurring at earlier ages. In a second phase, women in these countries have been postponing and spacing out the birth of their first (rank 1) and second (rank 2) child at increasingly advanced ages, leading to a rise in the mean age of mothers. Following this mechanism, there was a sharp fall in the mean age between the 1950s and 1980s, followed by a spectacular rise to very high levels in 2015–2019: 32 years for Spain and Italy, 31.4 years for Greece and 30.6 for France. These countries, unlike the previous ones, seem to be converging towards a similar mean childbearing age. What these countries have in common is that they have low fertility rates.

The third group consists of Bulgaria, closely followed by Croatia and Serbia. These countries had the lowest mean age at childbearing over most of the study period, never exceeding 28 years until recently. Since the early 1990s, however, the birth timing in these countries has been on the rise, reaching 28–29 years in 2020. They seem to be following suit of the previous group. Turkey can also be included in this group, as the age at childbearing has always been low, through notwithstanding its higher fertility relative to other countries in this group. Bosnia-Herzegovina and Macedonia, which started out with a childbearing age two years older than their Serbian and Croatian neighbours in the 1950s, now have the same U-shaped profile and have thus caught up to them. A convergence towards higher mean ages at childbearing in this group is underway.

We conclude this section with the three countries with atypical developments: Egypt, Kosovo and Albania. In the latter, the decline in the childbearing age has been almost continuous since 1950, from 31 to 27.5 years. It has hovered around this value since the mid-1990s, but appears to be rising again in 2015–2019. Kosovo follows a similar trajectory, but its age at childbearing stagnated at a higher level (29 years) between the 1980s and the late 2000s. As for Egypt, whose demography has been defined by Ambrosetti (2011) as exceptional, it has a rather stable age which mothers give birth, with a recent slightly downward trend (28.5 in 1950, 27.7 years 2020). Unlike the other Mediterranean countries, the mean age at childbearing is not increasing, but has been decreasing since the end of the 1980s, a sign of a specific fertility regime.

These mean ages at childbearing summarise a variable fertility according to women's age group. We will therefore analyse age-specific fertility rates in order to identify different age-specific fertility profiles, which will help highlight the different

---

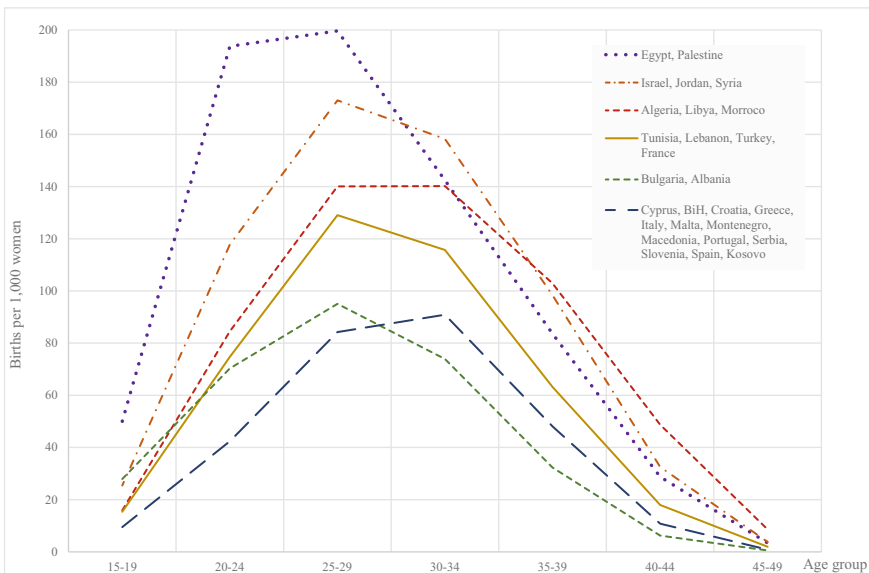
<sup>5</sup> With the exception of Malta, which has a more U-shaped curve.

ways in which age groups contribute to fertility intensity and timing in different countries.

### 5.3.2 Fertility by Age Group

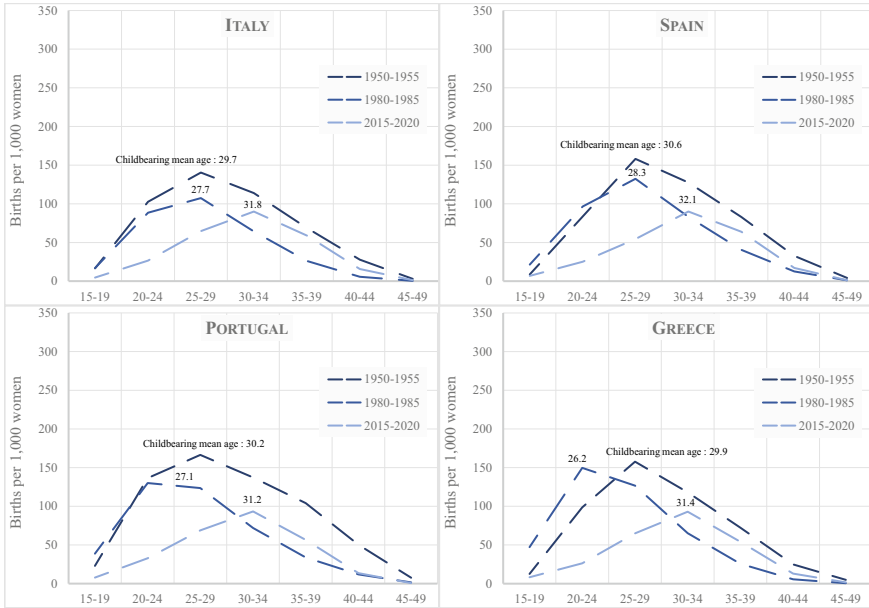
A typology of fertility rates by age group for the 27 countries in 2015–2019 shows more precise age-specific fertility profiles (Fig. 5.3). The higher the curves, the higher the fertility intensity, i.e. the higher the number of children per woman. The more they are shifted to the right, the higher the mean age at childbearing.

Two countries, Egypt and Palestine, have more or less the same profile with high fertility in the younger age groups. This distinguishes them from Israel, Jordan and Syria, who have a later fertility. At the other end of the spectrum, it is striking that about one in two Mediterranean countries now belongs to the category of countries with very low fertility. So far, this very low fertility is only found on the Northern Shore (Southern Europe and the Balkans). These very low fertility Mediterranean countries have an average fertility of 1.4 children per woman in 2015–2019. These are Cyprus, Bosnia-Herzegovina, Croatia, Greece, Italy, Malta, Montenegro, Macedonia, Portugal, Serbia, Slovenia and Spain. A third group, Bulgaria and Albania, has very low fertility like the countries in the previous group, but high fertility among young women, bringing their age-group fertility profile closer to that of Egypt and Palestine.



**Fig. 5.3** Typology of fertility rates in the Mediterranean (2015–2019) (Source World Population Prospects, 2022)



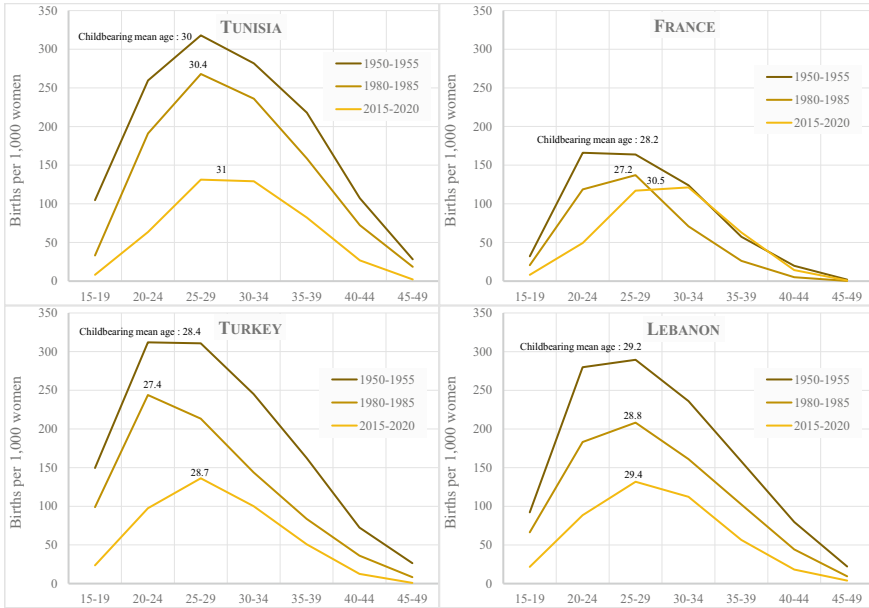


**Fig. 5.4** Evolution of mean age at childbearing and fertility rates in Italy, Greece, Portugal, Spain (1950–2019) (Source World Population Prospects, 2022)

Among these countries that are below the replacement level fertility, four are emblematic of a very low fertility rate that has been in place for several decades. These are Italy, Portugal, Greece and Spain (Fig. 5.4).

These countries have low fertility at all ages (less than 100 births per 1000 women), as well as a mean age at childbearing of around 32 years (which is the same as the age at birth of the only child) which will continue to increase.<sup>6</sup> These ageing countries have been affected by various economic crises and have been slow to introduce genuine birth policies. This prolonged low fertility explains the negative natural balances of these countries (Chap. 4). It also creates a depopulation mechanism, which at the sub-national level can be accentuated by internal migration and an increasing number of elderly people (Doignon et al., 2016).

<sup>6</sup> It is possible to calculate for each age group how many women have already given birth to a child and to assess the evolution of this age-specific fertility from one period to the next. When the curves fall from one period to the next, it means that the number of children born to women of a given age group has decreased over time: girls have fewer children than their sisters, let alone their mothers at the same age. The fertility timeline reflects the mean age at which women have children. A postponement of the age at which women have their children is observed concomitantly with a decrease in fertility intensity (and vice versa). When the curves shift to the right, it means that births are occurring later on average. This decline in the age at which children are borne is a sign that the population has mastered modern contraception. This has spread throughout the population and is a sign of a transformation in the value and place of women in society. In order to analyse this evolution of the fertility timeline, in relation to intensity, it is useful to observe them simultaneously.

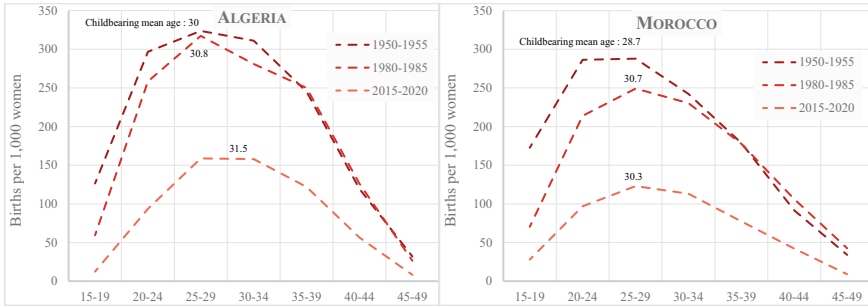


**Fig. 5.5** Evolution of mean age at childbearing and fertility rates in France, Tunisia, Turkey, Lebanon (1950–2019) (Source World Population Prospects, 2022)

Other populated Mediterranean countries (France, Turkey, Tunisia, Lebanon) are also in a situation of low fertility, but whose level makes it possible to maintain a positive natural balance. These countries, unlike the previous ones, belong to different Mediterranean shores. They have a fertility rate around the replacement level, thus well above the previous group. These countries are experiencing a postponement of the age at which women have children, but with a more sustained intensity, especially over the age of 30 (Fig. 5.5).

France, Lebanon and Tunisia now have relatively similar characteristics: fertility around the replacement level and shifting towards older ages, although the history of fertility decline in Tunisia is much more recent<sup>7</sup> and rapid than in France. Turkey is included in this group because its fertility is at the replacement level. However, it differs in that its fertility intensity among 20–24 year-olds is much higher (almost double that of France and Tunisia). Turkey could have been in the Algeria/Morocco group, but was distinguished from these countries because of its long-standing lower fertility and its much lower fertility intensity at older ages.

<sup>7</sup> The history of fertility decline in the Maghreb and Tunisia in particular, is well documented (Fargues, 1989; Gastineau, 2012). As soon as they became independent (1956 for Morocco and Tunisia, 1962 for Algeria), these countries adopted very different population policies. Tunisia resorted to a very firm policy of limiting births since the 1960s (Lévêque, 2017; Ouadah-Bedidi et al., 2012). As a result, it had the earliest and most pronounced fertility transition, which many explain by a change in the family code that recognises equal rights between men and women (Fargues, 1989).



**Fig. 5.6** Evolution of mean age at childbearing and fertility rates Algeria, Morocco (1950–2019) (*Source* World Population Prospects, 2022)

The other three groups identified in Fig. 5.3 cover intermediate to relatively high fertility situations.<sup>8</sup> The fertility profiles of Algeria and Morocco (Fig. 5.6), for example, differ from the previous group (Tunisia, France, Turkey, Lebanon) in that their fertility is more sustained after the age of 30. Births of rank 3 or 4 children are still very present in these societies, helping to boost fertility. Together with Libya, they are the only two countries<sup>9</sup> with such high mean ages, above 31 years, a characteristic more commonly found in the countries of the Northern shore.

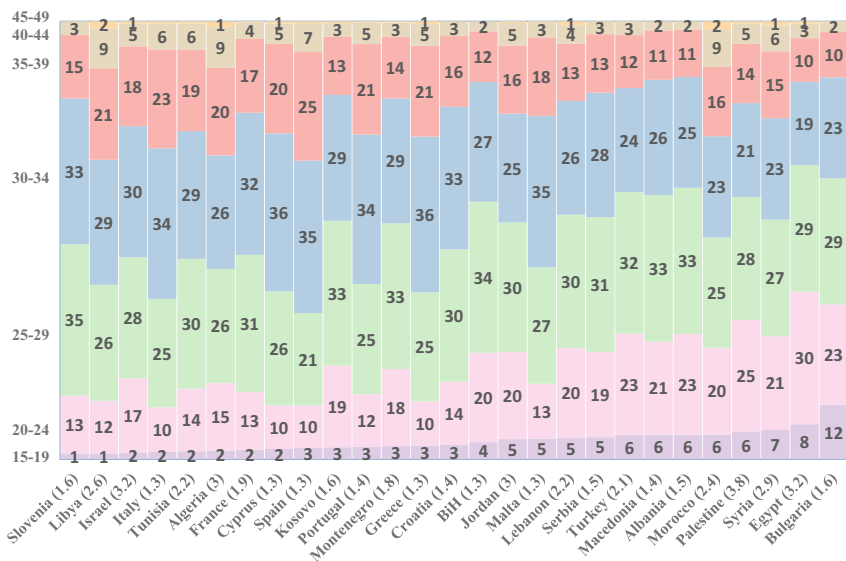
## 5.4 Specific Contributions of Age Groups

By analysing the quantiles of fertility rate distributions by age group, we are able to distinguish two large groups: one made up of 13 countries, the other of 14 (Fig. 5.7).

The first group's fertility is marked by a fairly early mean age at childbearing (below 30 years), whereas the second group's age is much older (above 30 years). Bulgaria, Egypt, Palestine, Syria, Turkey, Albania, Macedonia, Serbia, Jordan, Bosnia-Herzegovina, Lebanon, Montenegro and Kosovo are countries where births take place earlier on average (irrespective of their fertility levels, which may be very

<sup>8</sup> The difference in fertility behaviour between the Maghreb and the Near East can be explained in part by the colonial heritage and the strong influence of the diaspora, which is rather oriented towards Europe in the case of the Maghreb, and towards the Gulf countries in the case of the Near East (see Chap. 8). In the Maghreb, these factors constitute “the main and direct agent of European cultural influence” (This text has been translated into English by the authors. The original text in French is as follows: “l’agent principal et direct de l’influence culturelle européenne”) (Courbage & Todd, 2014). Libya’s behaviour is close to the Maghreb, as is Egypt’s with Near Eastern countries (Lévêque, 2017).

<sup>9</sup> Unlike Tunisia, Algeria did not have the necessary means to control its population’s fertility after independence. Nevertheless, fertility fell rapidly, particularly as a result of the lowering age of marriage, before the first birth control programme in 1983 was introduced and subsequently accelerating the phenomenon among all age groups (Ouadah-Bedidi et al., 2012).



**Fig. 5.7** Contribution of each age group to total fertility in % (2015–2019) (Source World Population Prospects, 2022. Calculations made by the authors)

different<sup>10</sup>). In contrast, births are more likely on average to be due to older women in the following countries: Malta, Portugal, Croatia, Spain, Greece, Italy, Tunisia, Algeria, Israel, Libya, France, Slovenia, Morocco and Cyprus.

In the first group with early fertility, 30% of total fertility is already reached at 25 years of age on average, and about 60% at 30 years. In the second group where births are occurring later in a woman's life, only 16% of total fertility is reached at age 25 on average and 43% at age 30.<sup>11</sup> In other words, 4 out of 10 births are to women over 30 in the first group compared to 6 out of 10 in the second.

Using this method, it is possible to identify a potential explanation for the decline in fertility in the first group with early fertility: it is due to the fertility behaviour of the youngest women. Will women aged 15–19, and especially aged 20–30, postpone the arrival of their first child and any subsequent children until later in life? Or will they continue to start their fertile life well before the age of 30? Increasing access to school and higher education, rising living standards, urbanisation and changing

<sup>10</sup> The higher fertility level of young women can therefore be found in countries where fertility is still high (Egypt, Morocco, Palestine, Turkey, Syria, Jordan), but also, though less intuitively, in countries on the northern shores (Bulgaria, Macedonia, Serbia, Albania), where the low total fertility level is largely due to the fertility of young women. For example, almost 12% of Bulgaria's total fertility is accounted for by 15–19 year olds, whereas in other countries with very low fertility (Italy, Portugal, Greece, Spain, etc.) this group contributes only 2 to 3%.

<sup>11</sup> From this point of view, Morocco is an exception, because despite an age at childbearing of over 30 years, the fertility level of young women (15–24 years) remains higher than that of the other countries in this group. Similarly, the fertility of women aged 30–39 is lower.

gender relations promote greater equality are likely to be determinants for postponing to have children plans. Several studies highlight the different places countries are in vis-à-vis school transition (Lévêque, 2017; Lévêque & Oliveau, 2019). The close correlation between urbanisation and schooling is thus highlighted after analysing fertility according to women's qualifications in the Mediterranean. This shows that the urbanisation of countries is a fundamental factor in the variations observed, since it leads to an increased spread of education accompanied by a decline in fertility. However, other "political, ideological and economic system factors, such as free-trade liberalism or dirigisme (...) can also influence the course of fertility"<sup>12</sup> (Courbage, 1999).

In contrast, in countries with later fertility, half of total fertility on average is accounted for by women aged 30–40. Fertility in the countries of Southern Europe and the Balkans (with a few exceptions already mentioned), but also in some Maghreb countries (Tunisia, Algeria, Libya) is dominated by the contribution of 30–34 year olds. In these countries, more than one third of total fertility is accounted for by women aged 30–34 alone. The fertility of these intermediate age groups in low total intensity countries is a sign of women's willingness to carry a pregnancy to term once a certain number of conditions are met (housing, professional situation, marital stability, etc.).

In a large number of Balkan countries (Bosnia, Albania, Slovenia, Montenegro, Macedonia, Serbia, Croatia), a notable contribution to fertility is made by 25–29 year olds. This contribution of the youngest is rather singular in that it only concerns countries with very low fertility. Thus, even among low fertility countries, it is still possible to introduce distinctions. The low fertility of the Balkans is still due to young or even very young women, while the low fertility of the largest countries in Southern Europe (Italy, Spain, Portugal) and Greece is due more to older women.

Fertility in the Maghreb countries remains marked. In addition to the contribution made by younger women who nevertheless postpone their first childbirth, a significant contribution is made by the older age groups, those aged 35–39 and 40–44. Spain, Italy, Portugal and even France, which have much lower fertility, also have fertility that has been driven by women over 35, but it does not resonate in the same way. In the Maghreb, it still represents a progression margin which may make it possible to imagine a drop in total fertility once these generations have disappeared.

The fertility of women over 45 contributes little to fertility (between 0.1 and 1.8% of the total). A hierarchy of countries according to their regional affiliation is however noted. More than 1.5% of total fertility in Morocco and Libya is still accounted for by women aged 45 or over. This was followed by Algeria (1.3%), Syria (1%), Lebanon (0.9%), Greece (0.6%), Egypt and Israel (0.5%). Despite this small contribution, the late fertility in North African or Near Eastern countries is a sign that stopping fertility may not be established in all strata of society and reveals

---

<sup>12</sup> This text has been translated into English by the authors. The original text in French is as follows: "facteurs politiques, idéologiques et sur les systèmes économiques: libéralisme libre-échangiste ou dirigisme, (...) peuvent également infléchir le cours de la fécondité".

potential differences between urban and rural areas. Higher order fertility (3 or more) has not completely disappeared and is probably due to older women.

The geographical distribution of these two groups is interesting. Indeed, it seems to extend the Hajnal line (Hajnal, 1965) into the Mediterranean. The latter divides the European continent along a north-east/south-west axis, from St Petersburg to Trieste. It distinguishes two historically persistent European family patterns, with earlier fertility to the east of this demarcation than to the west. Thus, the countries in the first group are mainly found in the Eastern Mediterranean Basin, i.e. from Bosnia-Herzegovina to Egypt. In contrast, the countries in the second group are located in the western basin. This geographical demarcation also holds true for age at marriage and permanent celibacy (see Chap. 6).

In addition to the fact that these analyses make it possible to examine jointly the situation of all the Mediterranean countries with regard to the fertility timeline in 2015–2019, they make it possible to identify the age groups likely to modify their fertility behaviour from one generation to the next. By identifying the most fertile ages when it comes to fertility, it is possible to go beyond the United Nations projections and propose individualised scenarios on fertility changes.

## 5.5 (Un)certainities for the Future of Mediterranean Fertility

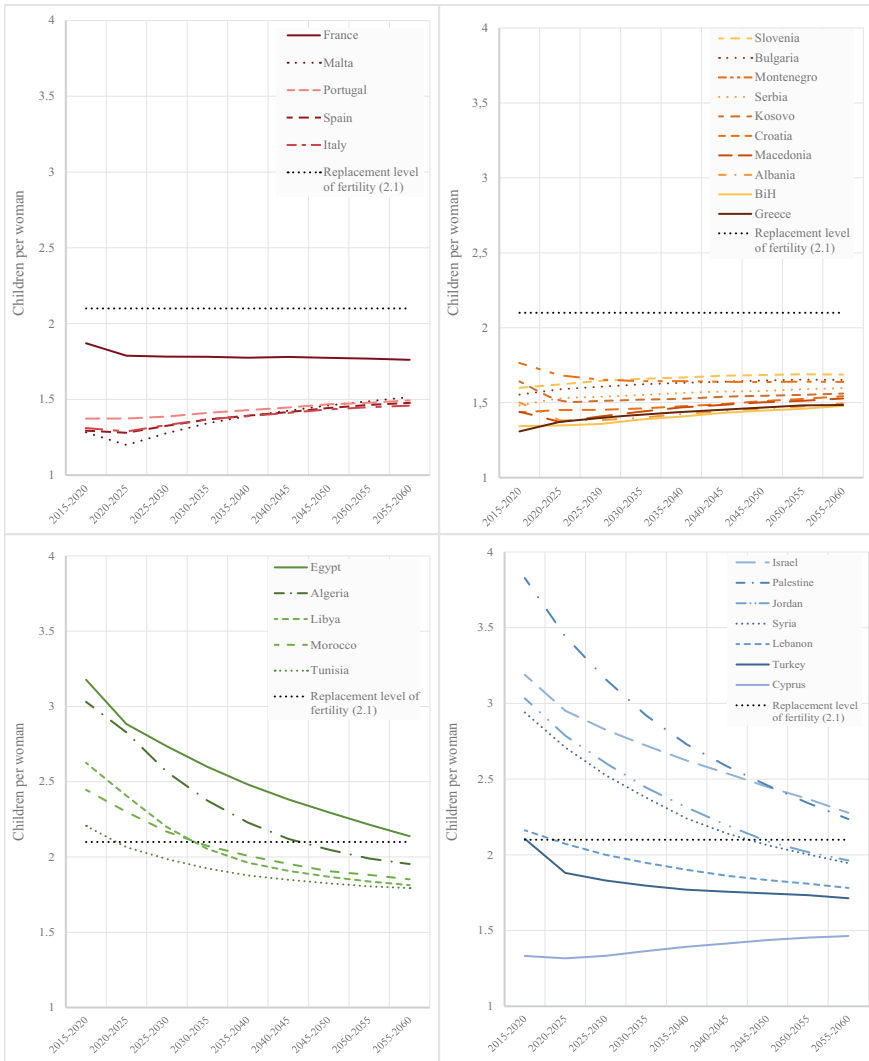
According to the median scenario of the *World Population Prospects (2022)*, the fertility gap between the most and least fertile Mediterranean countries by 2060 will be less than 1 child per woman (0.8 children to be precise), whereas it is currently 2.5. This scenario highlights a significant reduction in fertility disparities in the Mediterranean (Fig. 5.8).

The estimated average fertility in the Mediterranean will fall from the current 2 children to 1.7 children per woman. This situation is unprecedented since this threshold, which does not allow for the level replacement of generations (one couple is replaced by less than one couple in adulthood), is foreseen in the median scenario. Figure 5.8 shows that in this median scenario,<sup>13</sup> only 3 countries remain above 2.1 children per woman (Israel, Palestine, Egypt) to which can be added Jordan,

---

<sup>13</sup> “Probabilistic projections are based on statistical models, mostly parametric. Uncertainty about certain components of the population can be captured by error terms, as in the case of time series, but it can also come from Bayesian inference of the model parameters. The whole point is to quantify the uncertainty about the future population. This can be done using the stochastic approach, the Bayesian approach, or even a combination of both” (Costemalle, 2021, 32).

This text has been translated into English by the authors. The original text in French is as follows: “Les projections probabilistes reposent sur des modèles statistiques, la plupart du temps paramétriques. L’incertitude sur certaines composantes de la population peut être captée par des termes d’erreurs, comme dans le cas des séries temporelles, mais elle peut aussi provenir d’une inférence bayésienne des paramètres du modèle. Tout l’objectif est de quantifier l’incertitude sur la population future. Pour cela, on peut utiliser l’approche stochastique, l’approche bayésienne, ou même une combinaison des deux”.



**Fig. 5.8** Comparative fertility perspective for the Mediterranean, by country (2015–2055, median variant) (Source World Population Prospects, 2022)

Syria and Algeria (slightly below 2 children per woman). Of course, the fertility situation in the Mediterranean in 2060 varies according to the projection scenarios, and the confidence intervals considered for the probabilistic scenarios. For example, if we consider the upper bound of the 80% confidence interval (CI) of the median scenario, this would mean 10 countries would have a fertility rate above 2.1 children per woman instead of just 3 countries. Conversely, all countries would be below this threshold with the lower bound of the same CI. However, in all three cases,

the projections demonstrate an overall fertility convergence in the Mediterranean (Fig. 5.8): convergence towards an average fertility rate of 1.35, 1.7 or 2.1 children for the lower limit of the 80% CI, the median scenario and the upper limit of the 80% CI respectively.

In view of the findings articulated in this chapter and based on the same observation made by other demographers specialising in the Mediterranean,<sup>14</sup> we wish to carry out a more individualised prospective reflection for the Mediterranean as a whole. Instead of a generalised convergence of the Mediterranean countries towards a single fertility level, it seems possible to envisage in the future a convergence by groups of countries (Doignon, 2020). The challenge would therefore be to take into account socio-political situations and territories on the basis of both their demographic history and recent developments so as to be able to anticipate reversals in the situation.

To contribute to this prospective exercise, we propose first of all to closely monitor the evolution of timing and fertility intensity in countries with very low fertility, in particular the countries of Southern Europe, the Balkan countries (Bosnia and Herzegovina, Croatia, Bulgaria, Albania), but also Cyprus. These countries are at the top of the list of countries with the lowest fertility in the world (along with Taiwan, Macao, Hong Kong, Singapore and Moldova), and ahead of or not far behind Japan, Germany and Italy. This very low fertility rate has been established over time and it is easy to imagine that it will remain stable or even continue to fall to historically low levels. This hypothesis is corroborated by the cumulative results of several surveys which show, despite the persistence of the two-child model, the rise in preferences for the one-child family model as well as for childless families (Sobotka & Beaujouan, 2014). In this way, the Balkans, Cyprus and Portugal could form a group in which a pattern of very low fertility (1.3–1.5 children per woman) would continue.

In Bulgaria and Albania too, surprises are to be expected from the younger generation. If the latter end up delaying their timing of fertility, the decline in fertility at younger ages will have a significant impact on overall fertility, allowing these countries to move into the group of countries with low fertility and late timing.

Israel's fertility is rather atypical in the sense that its fertility has been more or less stable since the mid-1980s at around 3 children per woman. This trend does not argue for a convergence to low levels within a 35-year time horizon. It is therefore likely that Israel's fertility will remain around 3 children per woman. It is more difficult to say for Palestine, as its fertility is still declining at present and the level at which it will stabilise is still uncertain.

Jordan and Syria are notable for the regularity and rapidity of their fertility decline, like Palestine. The latter, however, still has a fertility rate that is almost 1 child on average above Jordan and Syria. The future development of Jordan is still uncertain, as it is still decreasing at the moment, after a stagnation in the 2000s. For Syria, despite a pro-natalist policy, the political and economic crisis that affected the country from the 1980s onwards had a lasting effect on the population and led to a considerable

---

<sup>14</sup> We thus support the observation of the demographer Youssef Courbage, who already in 1999 insisted on the need to supplement these indispensable United Nations projections with methods that take into account specific situations.



drop in fertility (Lévêque, 2017), which is still ongoing. Fertility has certainly been affected by the conflict since 2011, although it is difficult to quantify this impact. When the conflict ends, fertility can follow several possible developments. Will there be catch-up fertility (and thus an increase in fertility) or will fertility rates during the Syrian conflict be maintained? There is therefore uncertainty about the future of Syrian fertility and the level at which it will stabilise.

Algeria, Libya, Morocco and Egypt are also countries whose fertility trends are uncertain given the situation observed in recent years. Their respective situations deserve to be studied separately. The Moroccan fertility rate is a source of concern since, after a sharp decline until the early 2000s, there have been periods of plateau and recovery (Ouadah-Bedidi et al., 2012). In Morocco, one interpretation given to the emergence of this resistance is the slowing down of the rate of progress of education as well as the geographical isolation of the country described as quite remote from the rest of the Arab world by Courbage and Todd (2014). Despite a very recent decline in fertility, one could imagine Morocco's fertility converging around 2.5 children. This is also true for Algeria and Egypt, which are showing signs of resistance to rejoining replacement level fertility due to early births, but which still extend into old age. It might be more likely that the threshold of 2.5 or even 3 children is a convergence threshold for the latter two countries. Turkish fertility, like Lebanese fertility, is likely to decline if younger women delay having children more. Otherwise, it could remain stable at around 2 children per woman.

The aspirations of a growing proportion of women of the new generations (see Chap. 6), which are very different from those of their sisters and mothers, will undoubtedly be factors that will weigh and argue in favour of lower fertility scenarios throughout the Mediterranean. However, different cultural models, changing gender relations and the geopolitics at work in this complex geographical area all work together to slow down these declines and reach thresholds. In the next few years, we could expect to see a decrease in the differences between countries where the fertility level amongst the most educated is already low. In countries where the fertility level of the most educated is still high, the trends will depend in part on the openness of local communities to globalisation and the openness of attitudes, as Fargues argues (2000).

## References

- Ambrosetti, E. (2011). *Égypte, l'exception démographique*. Les cahiers de l'INED 166. Institut National d'Études Démographiques. <https://books.openedition.org/ined/1778?lang=en>
- Costemalle, V. (2021). Bayesian probabilistic population projections for France. *Economie et Statistique/Economics and Statistics*, 29–47. <https://doi.org/10.24187/ecostat.2020.520d.2031>
- Courbage, Y. (1999). *New demographic scenarios in the Mediterranean region*. Travaux et documents 142. Institut National d'Études Démographiques-Presses Universitaires de France.
- Courbage, Y., & Todd, E. (2014). *A convergence of civilizations: The transformation of Muslim societies around the world*. Columbia University Press.

- Doignon, Y. (2020). Demographic ageing in the Mediterranean: The end of the spatial dichotomy between the shores? *Spatial Demography*, 8, 85–117. <https://doi.org/10.1007/s40980-019-00054-2>
- Doignon, Y., Oliveau, S., & Blöss-Widmer, I. (2016). L'Europe méridionale depuis 20 ans: Dépeuplement, dépopulation et renouveau démographique. *Espace Populations Sociétés*, 2015/3-2016/1, 23. <https://doi.org/10.4000/eps.6171>
- Fargues, P. (1989). The decline of Arab fertility. *Population*, 44, 147–175. <http://www.jstor.org/stable/2949078>
- Fargues, P. (2000). *Génération arabes: l'alchimie du nombre*. Fayard.
- Gastineau, B. (2012). Transition de la fécondité, développement et droits des femmes en Tunisie. *Les Cahiers d'EMAM*, 21, 75–94. <https://doi.org/10.4000/emam.521>
- Hajnal, J. (1965). European marriage patterns in perspective. In D. V. Glass & D. E. C. Eversley (Eds.), *Population in history: Essays in historical demography, Volume I: General and Great Britain* (pp. 101–143). Edward Arnold; Aldine Publishing.
- Jones, G. W. (2006). A demographic perspective on the Muslim world. *Journal of Population Research*, 23, 243–265. <https://doi.org/10.1007/BF03031818>
- Kirk, D. (1966). Factors affecting moslem natality. In B. Berelson (Ed.), *Family planning and population programs* (pp. 149–154). University of Chicago Press.
- Lévêque, É. (2017). *L'éducation efface-t-elle les frontières? L'exemple de la fécondité en Méditerranée*. Master's Thesis in Geography, Aix-Marseille University. <https://dumas.ccsd.cnrs.fr/dumas-01612919>
- Lévêque, É., & Oliveau, S. (2019). La transition de la fécondité autour de la Méditerranée: convergence générale et hétérogénéités spatiales, un éclairage par l'éducation. *Espace Populations Sociétés*, 2019/2. <https://doi.org/10.4000/eps.9025>
- Ouadah-Bedidi, Z., Vallin, J., & Bouchoucha, I. (2012). Unexpected developments in Maghreb fertility. *Population & Societies*, 486. <https://doi.org/10.3917/popsoc.486.0001>
- Sekrani, M. (1960). La fécondité dans les pays arabes: données numériques, attitudes et comportements. *Population*, 15, 831–856. <https://doi.org/10.2307/1526919>
- Sobotka, T., & Beaujouan, É. (2014). Two is best? The persistence of a two-child family ideal in Europe. *Population and Development Review*, 40, 391–419. <https://doi.org/10.1111/j.1728-4457.2014.00691.x>
- World Population Prospects 2022. (2022). United Nations, Department of Economic and Social Affairs, Population Division. <https://population.un.org/wpp/>

**Open Access** This chapter is licensed under the terms of the Creative Commons Attribution 4.0 International License (<http://creativecommons.org/licenses/by/4.0/>), which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons license and indicate if changes were made.

The images or other third party material in this chapter are included in the chapter's Creative Commons license, unless indicated otherwise in a credit line to the material. If material is not included in the chapter's Creative Commons license and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder.

