

Please note: This is the last working paper version before this study was submitted and accepted. Please cite as Millward, Robert and Baten, Joerg. “Population and Living Standards 1914-45”, *Cambridge Economic History of Modern Europe*, ed. S.Broadberry and K.O’Rourke, Cambridge: C.U.P. (2010), pp. 232-263, ISBN 978-0-521-88202-6.

CHAPTER 10

POPULATION AND LIVING STANDARDS 1914-45*

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1) Introduction

The 1914-45 period was littered with civil wars, famines, economic depression, population displacements, ethnic cleansings and World Wars and yet a clear long term demographic trend can be discerned. The total population of Europe rose from nearly 500

* A longer version of this chapter may be obtained by writing to the authors. Thanks to participants at the Lund workshop on population in July 2007 organised by Jonas Ljungberg, to the editors, to Nicholas Wolf and other participants at the 3rd RTN Summer Symposium, London, October 2007.

million in 1913 to nearly 600 million by 1950, a result of mortality falling more than fertility. In 1913 there were still very large differences in birth and death rates across Europe's regions with the highest in Eastern and Southern Europe. Despite massive short term shocks, the next 30 years was marked by huge overall declines in mortality and fertility and by a considerable narrowing of the differences across countries. Our first task is to explain the large declines and the convergence (sections 2 and 3).

A second distinctive feature of the period was the large movement and displacement of population within Europe. The underlying economic force was a large shift from agriculture to industry matched by the move from villages to towns which is analysed in section 4. Equally important were political forces linked to the collapse of the three multi-cultural empires (Ottoman, Russian, Austrian-Hungarian) which, together with the military expansions and contractions of the German Reichs in the two World Wars (see chapter 6), lead to huge population displacements, ethnic cleansings and deaths from wars, famines and deportations.

What effect did these massive changes have on living standards? Over the whole period, real incomes rose as did life expectancy, literacy and education levels. In sections 5 and 6 we examine how these developments varied across countries and how they were reflected in new measures of living standards like human development indexes and in biological indicators like the heights of individuals.

2) Public health and the transformation of life expectancies.

Historical demographers often characterise the period since the 18th century as one of a huge demographic transition in Europe. Population growth was initially modest since high birth rates were offset by high death rates, the latter a product of numerous epidemics, harvest failures, poor sanitation and medical care. A decline in both rates started in the 19th century but the 1914-45 period witnessed a very steep decline to a regime of low birth and death rates. It was interrupted by the 1940s baby boom but by the late 20th century the new phase of very slow population growth was confirmed. These demographic changes were not Malthusian. Fertility fell even though income levels were rising. The fall in mortality was due, as we shall see, as much to environmental improvements as to rising nutritional levels, which, in the Malthusian world, followed subsistence crises.

The long term decline in mortality started in the second half of the 19th century more or less everywhere in Europe (see chapter 5). After a slow start in the late 19th century, the decline was steep and pervasive 1914-45. More than a half of the rise in life expectancy over the 120 years from 1850 to 1970 occurred in the 30 years from 1914. Figures 10.1 and 10.2 plot the death rates from 1900 for 5 year periods (in order to display the long term trends) for a selection of countries with continuous time series. A wide range of mortality existed at the start of our period, with the levels higher in eastern and southern Europe. Deaths in the period 1910-14 ranged from 13 per 1000 population in Denmark and the Netherlands to 28 in imperial Russia and, on some estimates, over 36 in Turkey. What followed in Russia was quite remarkable. The Russian data have been the subject

of much debate but, after careful scrutiny of the sources, Wheatcroft (1999) is convinced that there was a steep fall in the death rate. Despite the prevalence of famines, wars and forced labour movements, the death rate had fallen to 11 by 1948. The combination of massive short term welfare losses

FIGURES 10.1 AND 10.2

and a secular rise in life expectancy was, says Wheatcroft, highly unusual. Although the Russian case is dramatic, the mortality decline was also abrupt and late in Germany, some of the features can be discerned in many other countries and the changes are consistent with the fact that the period is one of convergence. Our Figures are somewhat congested but that very congestion tells its own story. By the late 1940s many countries had moved into a range of 9 to 14 deaths per 1000 population. Of course crude death rates mask changes in the age composition of the population. Of note is that infant deaths saw a huge fall and a rate of decline which continued after 1950 (see chapter 15). As Figures 10.3 and 10.4 show, in 1910-14 infant deaths varied from 66 per 1000 live births in Norway to about 150 in many large European industrial towns and even higher in Hungary and the other parts of eastern Europe. Although there was not as much convergence as in the other age groups, infant mortality did exhibit the most precipitous fall of all and was the major element in raising life expectancy. In 1910 life expectancy at birth was about 55 years in Denmark, England and Wales and as low as 37 years in Russia and probably less than 35 in Turkey. By 1950 a majority of people had a life expectancy of 65 years or more (Caselli, Meslé and Vallin 1999, Shorter 1985).

FIGURES 10.3 AND 10.4

In looking for causes it is important to first note the key medical dimensions of ill health and mortality. At the turn of the century, the major health problems lay in infectious diseases, especially tuberculosis for the 15-64 age group, other diseases of a mainly airborne variety (influenza, bronchitis, pneumonia) for those less than 5 years old and diarrhoeal and congenital defects for infants. The reliability of these disease categories and the associated statistics varied considerably. The data for Italy, England and Wales are as good as any and they indicate that, of the gains in life expectancy 1911-51, about one half arose from reduced mortality from airborne diseases and a further quarter from diarrhoea, enteritis and the diseases and congenital defects associated exclusively with infancy and early childhood. Italy experienced a larger fall of diarrhoea and enteritis than England and Wales (where the fall had occurred in the late 19th century) and a smaller fall for the other categories. Similar patterns have been documented for many other countries including the Netherlands, Denmark, Germany, Spain and Portugal. An interesting contrast is between the Czechoslovakian provinces of Bohemia and Moravia which were economically more advanced than Slovakia and sub-Carpathian Ruthenia. As a mirror image of Western and Eastern Europe all these provinces saw a decline in infectious diseases and a rise in the 'modern' cardio-vascular and cancer ailments in the 1900-50 period but the point in time at which the latter became more important than the former was much later in the eastern provinces (Caselli 1991, Masova and Svobodny 2005).

Now very little of these improvements arose from scientific advances in medical knowledge. Vaccines like *Bacillus Calmetten Guérin* (BCG) and drugs like Streptomycin, for TB, emerged in our period but had little impact before 1945. The same can be said for gynaecological care. The major health improvements lay in a) reduced exposure to disease via better housing, sewerage and water supplies, b) increased ability to resist disease through higher nutritional status, a product of food intake and past exposure to disease. Infant mortality depended also on the condition of the foetus, itself linked to the health of mothers.

The beginning of the mortality decline in the late 19th century has generated a considerable literature about the role of nutrition versus public health (cf. chapter 5) but there has been hardly any debate about why the very steep decline and convergence occurred 1914-45; why it did not occur earlier or indeed later. It is important, we think, to focus on the coalescence of favourable forces from the first decades of the 20th century in the areas of sanitation, housing, health education and counselling as well as on the very strong, continuing rise in the health of mothers. Improvements in public health required funding and in particular investment in sewerage, drainage and water supply systems. It seems that, notwithstanding all the rhetoric of the 19th century public health movements, the major spending efforts did not occur until the 1890s and the early 1900s and even later in some countries. These were big capital works programmes, the major impact of which would be spread over the next 50 years or so. In many German cities, for example, water quality was still poor at the turn of the century, privies were common and the

spread of water closets had a long way to go. The evidence about the delays is clear for England and Germany and is probably symptomatic of what was happening in other parts of north-western Europe whilst for southern and eastern Europe these investments came even later (Bell and Millward 1998). An equally important factor for infant mortality was the large increase in support for mothers, which again is dated from the early 1900s.

Infant health movements swept the Continent in the decade or so before the First World War. There were more mid-wives, child care centres, promotion of breast feeding, more brochures and counselling and all supported by legislation passed in the 1900-14 period (Brown 2000).

The decline of fertility and family size in the late 19th century (see later), reduced the number of susceptibles in the home and this was well into its stride by 1913. Then there was the inter-war housing boom creating more space for living and working. In most countries the 19th century saw little relief from overcrowded conditions, exacerbated often by poor personal hygiene. Government involvement was largely a matter of regulating standards though this did mean that most new houses had better access to sewers and water supplies and had lower occupancy rates. There was a major housing boom in many countries in the 1920s. An important part was played by municipalities supported by state grants and subsidies and targeted at lower income families, slum clearance and new houses. In German towns with populations of 5000 or more, local authority capital expenditure on housing rose from 900 million marks in 1913/14 to 149,000m. reichmarks in 1925/6 and 205,000m. in 1928/9. As a proportion of all municipal expenditure on new construction and property, housing rose from 0.02% in

1913/14 to 25% in 1925/6 and to 23% in 1932/3. Even in a very rural country like Ireland, capital expenditure on housing by local government rose tenfold from £34 per 1000 population at the start of the inter-war period to £346 by 1936-8. In England and Wales, much richer countries, it rose from £67 to £1109. Capital investment in housing was not limited to the public sector and indeed in some countries the rise in privately financed home ownership exceeded the rise in municipal housing. In the period 1911-51, the housing stock in Britain rose by 60% and population by 21%. In Ireland the stock rose by only 6% but the population was falling so here again occupancy rates were improving. A final piece of evidence about the enhanced role of public health, water supplies and housing may be found in the pattern of all UK capital formation over the long period 1890-1945. Aggregate investment in these three key sectors rose to equal that for the whole of UK industrial investment in the 1890s and early 1900s. In the 1920s and 1930s, mainly because of the rise in housing, they became the dominant element of UK investment (Balderston 1993, Mitchell 1988).

The fact that the data for these sectors are readily available for the British Isles and Germany is not an accident since they were often seen as pioneers in public health. The substantial investment in public health and hygiene during the Weimar Republic has been characterised as part of the creation of an embryonic welfare state, a “Sozialstaat”. The messages about clean, more spacious houses, factories and hospitals and investment in sanitation, housing and water supplies were taken on board in the economically less developed parts of Europe. The zemstvos (local governments) of imperial Russia, with their emphasis on public health and hygiene were influenced by the sanitary movement in

the West and continued under the Soviets. There was a substantial increase in medical personnel, hospitals and centres for TB, VD and child care in the 1920s. In Spain the improvements in hygiene and health in the 1920s have been attributed to the institution of programmes of public health. 'Social medicine' was seen as adding the social sciences to medical knowledge but, with malaria rampant in rural areas, the Spanish government's commitment to improving the lot of the peasantry had to be gained. New Ministries of Public health were established in Yugoslavia and Czechoslovakia where however the emphasis on collective efforts, so necessary in public health measures, had to confront resistance from the traditional private therapy of the doctors. The damaging delays in conquering malaria in Macedonia (not till the 1960s) has been attributed to the educational problems of implanting a culture of public health (Stachura 2003, Emmons and Vucinich 2005 chapter 8, Dugec 2005, Zylberman 2005).

All these factors reducing exposure to disease (and indirectly raising nutritional status) took place whilst food intake and real incomes were on an upward path, albeit not a very steep one. These developments will be discussed in more detail later in this chapter but in the meantime we may note that both GDP per head and real wages were generally higher in 1950 than 1913. There were of course great differences across different income groups, the depression of the early 1930s saw wages stagnate and many were unemployed. On the other hand, because of falling fertility (cf later) and thereby falling numbers in the 0-15 age bracket, the ratio of dependents to the working population was actually falling so that the need to finance unemployment was, in aggregate at least, offset in part by the smaller needs of the 0-15 year group. A further result of income

increases, as well as the emergence of large scale refrigeration techniques, was that the ratio of meat consumption (and hence protein) to cereals generally rose in this period. Overall however it does not appear that rising real incomes could have been the major element in the huge fall in mortality. Russia is a poignant illustration that the local food situation (in time and place) cannot explain the downward trends in mortality. World War I lasted from 1914 to 1917 in Russia. It was followed by civil war and famine 1917-22, another famine in 1931-3 and the period 1942-5 has also been classed as one of famine. Yet the long term decline in mortality in Soviet Russia was steeper than in most other European countries.

The very large fall in infant mortality was a product of three factors. First was the already noted improved support and counselling for child care. Secondly the improvement of the physical environment reduced the infant's exposure to disease. Thirdly and possibly even most important was the health of mothers. The latter, and hence the condition of the foetus, improved rapidly during the late 19th century. The smaller number of births which accompanied fertility decline (see later) probably also eased the health of mothers and hence the condition of the foetus. Female mortality levels fell faster than males in the 19th century and by 1913 female mortality was generally lower than that of males except for the 5-49 age group. Thereafter the decline in female mortality was so steep that by 1950 it lay below that for males for all age groups. Females were less exposed to the direct losses of military combat, less susceptible to alcohol, their ranking in family hierarchies was rising as agriculture and mining (with their male dominated cultures) declined and as women became paid employees in the war periods and textiles generally.

Improvements in public health, housing and real income occurred everywhere but in eastern and southern Europe there was more to overcome given their starting high levels of mortality. On the other hand, as we have seen, knowledge of the relevant child care, sanitary and public health measures was spreading. Notwithstanding the de-globalisation in capital and goods markets, the 1914-45 period was one where good health practices were known and spreading. The more benign health environment of north-west Europe was attainable and most countries had come close to that by 1950. The main exceptions seem to prove the point. The remaining very high death rates in less economically developed regions like Albania and southern Italy have been attributed to deficient sanitary conditions, hygiene norms and medical support. In Turkey the long term decline in mortality did not start until after the Second World War. The continuing high level of infant mortality in southern Italy meant that the aggregate figure for Italy as a whole did not fall below 100 infant deaths per 1000 live births until after the Second World War. Albania was of course a region with all the signs of an underdeveloped country whilst in Italy (because of the favourable attention to the north in reconstruction after World War I and in fascist policy thereafter), most of the socio-economic indicators showed the south-north gap widening in the first half of the 20th century. But these regions were the exceptions. For most of Europe, convergence in life expectancy was nearly complete.

3) Family and Work: Economic Factors in Fertility Decline

In the first half of the 20th century, birth rates declined steeply – a collapse similar to that for mortality. The fall was so strong that, despite the decline in mortality, many countries became worried about population stagnation and ‘natality’ programmes flourished. In Table 10.1 the data for a sample of countries illustrates how the signs of decline were present in the late 19th century and also that the decisive fall was in the 1920s and 1930s. In the early 1900s there was still a wide range of birth rates from less than 30 per 1000 population in northern and western Europe to 41 in Bulgaria and nearly 50 in European Russia. As we shall see, France and Ireland, for contrasting reasons, were distinct outliers at the bottom end, at 19 and 23. In general the propensity to marry was greater and the age of marriage lower in Eastern Europe. In 1920, some three-quarters of women aged 20-24 were still single in Western Europe while in Eastern Europe three quarters were married. In Romania, Serbia, Bulgaria and Hungary less than 5 % of the population in the age range 45-49 were celibate, about half the rate found in Northern and Western Europe (Hajnal 1965).

TABLE 10.1

The leading lights of the well known European Fertility Project of Princeton University placed the decisive downturn for a large cluster of countries in the 1890s (Coale 1986). France started much earlier. Several countries in Eastern and Southern Europe did not start their long term decline until the 1920s – Russia, Spain, Portugal. A few regions, southern Italy being the best example, had to wait until after the Second World War and,

on one estimate, the fertility level in Turkey was actually rising from about 5.4 births per mother in 1923 to just over 7 in 1930-5 (Shorter 1985).

Changes in birth rates can arise from changes in the age composition of the population and in particular in the number of females in the child bearing age range of 15-49. Young readers will also perhaps need to be reminded that most births in this period took place within marriage. Even if one relates the number of births to the number of women in the 15-49 age group, as we do in the following figures, there is still then the problem that such overall fertility measures may change simply because the numbers getting married change and/or if the rate of illegitimacy changes. During our period illegitimacies remained, with some exceptions, roughly constant at about 10% of births. Also the age at which people married had been fairly constant for a long time. It did not change until the marriage boom of the late 1930s and 1940s. For the large part then, the main changes in the overall fertility levels shown in Figures 10.5 and 10.6 reflect changes in levels of marital fertility. The data are for a selection of countries with continuous series and relate to 5 year periods in order to draw attention to the long term trends. They record for each period (say 1910-14) the number of babies a woman would have borne during her child bearing years (15-49) if she bore them at the rate all women did in that period (1910-14).

FIGURES 10.5 and 10.6

For many countries in 1910-14, the range was 3 to 4.5 births per mother which had fallen to about 2.5 in the late 1930s. This is a fall of about 40% with distinct signs of

convergence: the more rapid decline in marital fertility in Eastern and Southern Europe was reinforced, in terms of convergence, by a rise in marriage rates in Northern and Western Europe from the late 1930s. That marriage boom raised the central range of overall fertility levels to about 2.8 children by the 1940s. Conditions of war and reconstruction helped but this baby boom was a temporary phenomenon and the fertility levels of the 1930s proved to be a better indication of 20th century trends. Fertility levels had fallen, in some countries, to only about 2 children per mother in the 1930s, as they were to do in the latter part of the 20th century. Allowing for child deaths, that meant a reproduction rate less than 2, that is, below the rate necessary to maintain the population, in the absence of wars, immigration etc[‡]. A rough calculation suggests that in 1900 the death rates were such that the reproduction rate needed to sustain a population was about 3.4 children, a figure that, with death rates themselves declining, fell to 2.8 just before WWI, 2.5 in the 1920s, 2.4 in the 1930s and about 2.1 in the second half of the 20th century. On that basis, the time period when each country first hit the decisive bottom line was (ignoring the war years) as follows:

Pre 1914	France
1920-9	Austria, Germany, Sweden, Switzerland, UK
1930-9	Belgium, Czechoslovakia, Denmark, Norway

[‡] Note that it is common for demographers to focus on the ‘gross reproduction rate’ which is similar to the fertility measure in Figures 10.5 and 10.6 but counts only female births so that the benchmark net reproduction rate (the gross rate less the expected deaths of females up to age 49) is 1(unity). The rough calculations in the text concerning sustaining reproduction rates are based on Chesnais 1999 and on age specific female death rates in the UK.

For the rest of Europe it was much later – from the 1960s onwards. Of course for several Western European countries, there was a marriage and baby boom from the 1940s linked in part to WWII and this raised the reproduction rates above the target level but from the 1970s the previous patterns emerged. In our period 1914-45, low rates lead to worries in Denmark about the approach of ‘extinctness’. In fascist Germany the nation was deemed to be under threat, the fertility level fell below 2 in the early 1930s but, allowing for mortality, the reproduction rate had fallen below 2 in 1922. Natality programmes flourished in many countries though the exaltation of motherhood and family life took a racist tone in Germany. Aryans were encouraged to propagate but not Jews and Slavs.

How can one account for the huge fall in fertility 1914-45 and the tendency to convergence? Before looking at the economic issues, it is important to recognise that the fertility decline was strongly conditioned by socio-cultural factors. This is not surprising in that family size was affected by the age of marriage and birth control practices within marriage. The decline in fertility in this period is often termed ‘parity specific’ in that it involved controlling family size after some target number of children had been achieved (Coale 1986). Unlike the involuntary control that occurs during breast-feeding, wars etc., it required a willingness to use contraceptive techniques. Demographers have agreed that there was nothing new here in that coitus interruptus and abstinence had been used for a long time and high quality inexpensive condoms were apparently widely available in, for example, Germany by the early 20th century. It was the willingness of adults to use these methods that was important and recent interview evidence from old people suggest that

many of the negotiations between partners were tacit with uncertain aims (Fisher 2000, Guinanne 2003).

In sum we might expect fertility to decline more rapidly in middle class and non-catholic areas and to be enhanced by the spread of family planning programmes and increases in educational enrolment and literacy rates. At the same time, the pace of decline, its spread and convergence was strongly determined by economic forces. We suggest that it was a coalescence of four forces which accounts for the great decline in average fertility (roughly 40% over the 30 years 1914-45) and the convergence of levels by the late 1940s. First is the fact that as mortality declined, a given target family size could be achieved by a smaller number of births. The crucial long term decline in infant mortality started in the early 1900s and child mortality had been falling in many countries for some 30 years, enough experience to trigger off commitments to a smaller target number of births. In England and Wales for example, in 1871 there were 72 deaths per 1000 boys less than 5 years old, a figure that had fallen to 47 by 1911 and continued thereafter to fall to 23 in 1926 and to 7 in 1950. Similar patterns of child mortality have been recorded in France, Sweden, Norway, Germany and Castille in Spain. The experience of the two outliers reinforces the point. If French families had the same target family size as other European families, then, given they already had relatively low fertility levels by the end of the 19th century, we would expect adjustments to the mortality decline to be smallest of all. That is what happened -- France experienced the lowest decline in fertility 1914-45 and by 1950 it was no longer an outlier. Ireland also showed only a small decline in fertility. This was no doubt due in part to strong catholic traditions but it should also be noted that

its relatively healthy rural expanses meant there were only 38 male child deaths per 1000 in 1871 and it was not until 1926 that the recorded levels in Ireland, England and Wales converged at 23. Since, finally, the decline in mortality was steepest of all in many eastern European countries, that would make some contribution to inducing faster falls in fertility in these countries and hence to convergence.

The second key factor in 1914-45 was the large structural change in the European economies which reduced the significance of sectors like agriculture, cottage industry and outwork where the labour value of children was high and where the merging of work and home made good economic use of mothers' time. Shifts out of these sectors to service employment and factories reduced the labour value of children and raised the time cost of rearing them. A key indicator here is the percentage of the male labour force in agriculture. There were huge differences in 1911 matching some of the differences in fertility levels. Agriculture's share ranged from 11% in Britain and 24% in Belgium to over 65% in Poland, Finland, Romania, Bulgaria, Russia, Turkey and Serbia. The large fall over the 1911-50 period was accompanied by some convergence such that the major bunching by 1950 was of countries whose agricultural share lay between 20% to 40%. Of note are the large declines in Austria, Russia, Finland and Poland which also saw some of the largest declines in fertility. The modest declines in the agricultural sectors of southern Italy and southern Spain were matched by their modest declines in fertility. Turkey lost 20% of its population during WWI, including large numbers of urban dwellers, and was thereby more rural after the war than before.

Thirdly there is evidence of increasing participation of females in the labour market, raising the cost of children in terms of mothers' wages and use of time. Female employment was always high in textiles in the late 19th century and the decline in fertility was noticeably early in the Czech lands of Bohemia, a big textile area, and was rapid and substantial in the English textile towns (Millward and Bell 2001). In Turkey, over half the textile labour force in the 1930s was female; it was an urban based industry and fertility was distinctly lower in urban areas. Employment in secretarial, teaching and other service jobs rose throughout Europe in the inter-war period. The late 1930s saw a clearly rising number of women in full-time employment in Germany. Data for married females in Britain indicate a labour market participation rate of 12% for those aged 15-24 in 1911, and this rose to 18.7% by 1931 and 36.6% by 1951. For those aged 25-64 it rose from 9.7% in 1911 to 10.0% in 1931 and 22.5% by 1951 (much of which could have been the effects of war, Matthews, Feinstein and Odling-Smee, 1982, Table C.3). An interesting case is southern Italy where in the first half of the 20th century female paid employment actually fell (because of a decline in textiles and of fascist policy), providing an additional element in the very slow decline in fertility levels.

The fourth factor was the growing awareness of developments in family planning and an important element here was the rising literacy rates in eastern and southern Europe and rising school enrolments generally. Literacy rates were already 90% or more in northern and western Europe in 1913. In Spain the rate was only 52%, Finland 59%, Italy 62% and Austria 66%. These were all countries with fertility levels of four births or more per mother. By 1950 the literacy rates were over 80% with Finland 90% and Austria 99%.

The relatively low levels of literacy still found in Turkey (32%), Portugal (56%), Yugoslavia (45%) and Albania (46.2%) were reflected in their fertility levels being the highest in Europe in 1950 (Crafts 1997). Fertility levels also remained high in catholic regions like Ireland and parts of the Netherlands which witnessed very strong campaigns against family planning. Ireland and Portugal still had relatively low income levels and saw much emigration. Ireland saw a strong increase in educational enrolments in our period but many young people emigrated, leaving behind a population containing many men and women not married until their 40s.

Ireland was in fact a single outlier within Western Europe in still having a very low marriage rate by 1950. The marriage boom in Western Europe from the 1930s was a major break from the past. For centuries the age of marriage in Western Europe, which fluctuated in response to economic conditions, had not shown a decisive long term trend, upwards or downwards. The early age of marriage in Eastern Europe – characterised by Hajnal (1965) as a region to the east of a line from Trieste to St. Petersburg -- was associated with a culture of extended families though its origins may have lain in the relative abundance of land. The nuclear family household was more characteristic of Western Europe and the economic independence with which it was associated required couples to have a good prospect of an independent income. A large family size threatened family income per head and the traditional method of safeguarding that income was by delayed marriage. It seems likely that the decisive shift to earlier marriages in Western Europe from the 1930s, even when following the world depression, was a consequence of the new willingness and ability to control fertility within marriage. This is supported by

evidence from as early as the 1860s of a fertility decline in some departments in France being followed by rises in nuptiality in those same departments (Watkins 1986). The number of people who became married in 1913 varied from 10 per 1000 population in Ireland to 18 in Hungary and Romania. Such marriage rates rose decisively in Scandinavia, Austria, the British Isles and the Netherlands and by the 1940s many countries were in the range 16-21. The rates in Eastern Europe were somewhat higher but, despite a slight rise, Ireland was still an outlier (plus Greece) with only 11 persons per 1000 population becoming married in 1950.

4) Economic Migration

The most striking feature of population change in this period was not so much its growth over time as movements within Europe. The population increase was modest when compared to the rise in the late 19th century, especially since the large overseas emigration of that century petered out in the face of immigrant quota restrictions in USA from the 1920s and of the economic depression of the 1930s. Russia, Yugoslavia and the rest of Eastern Europe suffered most from the two World Wars but did see their population rise by nearly 40 million (m.). In North-West Europe it rose by slightly more. The remaining 20m. increase in Southern Europe constituted the largest proportionate change. Italy, Spain, Portugal and Greece all experienced some decline in fertility but it remained higher than in the rest of Europe.

The most harrowing dimension of migration was the forced movements associated with population displacement and ethnic cleansing which itself was closely linked to the political impact of the two World Wars (see chapter 6). Here we focus on economic migration which we should emphasise from the start was not primarily directed to permanent agricultural employment. Some from northern Italy did settle in S.W. France but they were the exception. There were many agricultural settlement and colonisation schemes promoted by national governments – Germany, Poland, Yugoslavia, Russia – but they all failed. The key driving forces in economic migration were industrialisation and the growing gap in income levels between the Americas and Europe. This gap had induced a peak overseas emigration rate of over one million persons per annum in the first decade of the 20th century (Table 10.2). The highest rates were in Italy where the underdeveloped south was the main source; similar push factors operated in Ireland, Portugal and Spain. Britain was also a major source both to the Americas and the Commonwealth (Canada, Australia, New Zealand etc) and this was given an extra boost by the support provided in the 1922 Empire Settlement Act. Latin America continued to welcome immigrants and 3m. arrived 1921-40. For many Europeans however the 1921 and 1924 Quota Laws in USA were a body blow. They limited immigration to 0.16m. persons per annum and its allocation across countries to the national origins of the US population, thereby effectively discriminating against Italy, Russia and Poland. Whilst 12.4m. Europeans entered USA 1901-21, this fell to 2.8 m. for 1921-40 (Faron and George 1999). Moreover the nationalistic policies of Germany and Italy made for active discouragement to emigration. The exceptions were Jews who were allowed to move and

where they were not, they escaped - the main non-economic overseas migration of the inter-war period.

TABLE 10.2

The major economic opportunities for emigration in the inter-war period therefore lay in the industrialising regions of Europe and to them large numbers flowed from rural areas in the same countries or from other European countries, with only a small trickle of non-European immigrants. The 1920s was an especially active decade but the world depression of the 1930s reduced the opportunities in urban areas. Some idea of the size of the shift may be given by a crude calculation that the share of the male labour force in agriculture over all Europe fell from about 55% in 1910 to 40% in 1950. Given the total European population figures recorded earlier, rural areas would have had over 80m. more inhabitants in 1950 if the agricultural share had remained at 55%; over one half is accounted for by the shift to industrial employment in Russia.

Santis and Livi Bacci (1999) have shown that in Italy the tendency to emigrate from any given region was greater, the larger was the share of agriculture in that region's economy and the lower was output per head. There is little doubt that applied to Europe generally. The general movement was from south and east to the west typified by what happened in Czechoslovakia. The net outflow 1921-30 from the eastern provinces was 1.2 m. from Slovakia and 0.15m. from Carpathian Ukraine whilst the industrialised western province of Bohemia had a net inflow of 0.03m. which rose to 0.33m in the 1930s (Kulischer

1948). For Italy, the industrial centres in the north like Milan and Turin replaced USA as the destination for emigrants from the south, in the same way that Britain became the main destination for the Irish whilst Spain also saw a massive shift from the south and west to the Basque, Catalonia and Centre regions. Even France, one of the least urbanised countries in North Western Europe saw the share of its population living in villages fall from 56% in 1911 to 45% in 1951. In 1911 only 27% of those aged 45 were borne in a different department; by 1932-6 it was 37%. The main destinations were the Ile de France and other industrial areas to which the net inflow was about 1m. persons during the years 1920-31. Within Poland there was considerable movement in the 1920s from the centre and south to western regions which promised access to the sea and industry. In 1918-21 some 0.9m. moved from former Russian and Austrian Poland to the (former German) western regions of Poznan and Pomerania where 'Polonisation' was more successful than the attempt at Germanisation had been in the years before WWI. In the 1930s with urban outlets and overseas emigration closed, many central and southern areas of Poland were seen to be overpopulated – 79 persons per square kilometre, about double that of France.

Nor were the migrations limited to transfers within each country. There had always been movements of seasonal agricultural labour across the French, German and Russian borders but industry now attracted those willing to stay. The main emigrants were from Poland, Italy, the Balkans, Russia, Spain and Portugal and the main destinations were northern France, the Ruhr and ports like Rotterdam and Hamburg. In Germany in 1914 there were already half a million Poles, Ukrainians and Byelorussians, accounting for 90% of the foreign labour force. They reinforced the internal rural exodus which in the

1930s saw the armament factories emerge as an important destination. From 1935 they were being built in the safer central zone and in the Berlin suburbs. By that time, with unemployment rising, new immigrant labour was being curtailed though in 1939 there was still half a million foreign workers. However, the most striking feature of the inter-war cross border economic migration was the flow to France. Faced with significant war losses and a long prior history of a stationary population level, it opened its doors to foreign labour (though entry permits were required). The emigrants entered mining, building, chemicals, steel and public works; over 60% of the labour in the Longwy steel works in 1929 was foreign. Some 0.6m Poles entered in the 1920s and up to 0.4m Spaniards. Residents of foreign origin in France rose by 1.7 m. from 1911 to 1931 by which time they totalled 3.3m. or 7.9% of the French population (Bardet 1999).

5 Changes in Income and Human Development

In the last sections of our survey, we will consider how all these developments affected people's welfare. We use three different measures of welfare development: (1) GDP growth as a proxy for purchasing power increase, (2) the Human Development Index (HDI) as a more comprehensive measure to include life expectancy and education, (3) human stature as an indicator of the quality of nutrition and health. Mapping these indicators will offer an overview of a large number of European countries simultaneously.

The increase of purchasing power during this period contains a number of paradoxes. Given the terrible destructions of WWI and WWII, the Great Depression after 1929, and the economic disintegration during the whole interwar period, we would not expect much growth of purchasing power. But national incomes did grow substantially and Foreman-Peck (1983) has argued that the wide diffusion of new basic technologies such as electricity and the combustion engine, while already developed before WWI, still led to income gains from their application in many fields. Moreover (cf. earlier), Europe benefited during this period from the demographic gift of having a modest share of population who were children and elderly persons who were not working.

FIGURE 10.7

The typical measure of purchasing power is GDP per capita. The UK was clearly the richest country in Europe in 1913, with almost \$5000 measured in 1990 dollars (Maddison 2001). In the next group, between \$3500 and \$4500, we find Switzerland, Belgium, Netherlands, Denmark, Germany, France, and Austria. The poorest countries were those in the Balkans, Turkey, and the Russian Empire. The growth of GDP per capita between 1913 and 1938 is displayed in Figure 10.7. In the map, we have recalculated all contemporary statistics to match modern borders. This makes the maps more easily readable for the modern reader, and facilitates comparisons of pre- and post-WWI.[§]

[§] Before the war Austria-Hungary formed a large Empire consisting of Southern Poland, south-western Ukraine, north-western Romania, Slovakia, the Czech Lands, Hungary, Austria, and the Northern parts of later Yugoslavia (and a small part of Italy). The Russian Empire included Finland and parts of today's Poland. The German Empire stretched to today's territories of Poland, Russia (East Prussia, eastern part),

In Figure 10.7, GDP in 1990 dollars is measured as an index, making it comparable with the HDI maps discussed later; it ranges between 0 and 1^{**}. Note that both Germany (under the Nazi government in 1938) and parts of the Soviet Union, might not have provided entirely reliable statistics. In most countries the change of purchasing power was positive between 1913 and 1938. Only Spain, which experienced the civil war of 1936-39, and Romania which suffered heavily from rural overpopulation and unsuccessful reforms, showed a decline in GDP between 1913 and 1938 (Feinstein, Temin and Toniolo 1997). Very modest were the increases in Bulgaria, Austria, Belgium, and Ireland. The strongest growth on the other hand can be found in Scandinavia, Switzerland, and Greece, whereas the countries of the Soviet Union, Turkey, and Portugal also performed relatively well, as far as we can tell from their GDP statistics. The latter three countries were converging from initially quite low levels of purchasing power.

Another way to measure living standards is by the Human Development Index (HDI). The idea behind this is to include life expectancy and education levels as well as purchasing power. As the aim of our chapter is to bring living standards and population development together, this index is particularly attractive. Its calculation takes into account minimum and maximum levels of three components:

- a) GDP per capita in 1990 dollars ranging from \$100 to \$40,000
- b) Life expectancy ranging from 25 years to 85 years

Denmark, and France (and small parts of Belgium and of later Czechoslovakia). Ireland was still part of the U.K. before WWI, and the Ottoman Empire still existed. In the interwar period, Czechoslovakia was one country, as was Yugoslavia, and Poland was situated further East, compared to today's position. Germany still had some Eastern territories such as Silesia, East Prussia, and Pomerania.

** 0 is set equal to the log of \$100 and 1 equals the log of \$40,000.

c) Primary school enrolment and literacy from 0 to 100 percent.

There is a debate about whether the HDI should include declining marginal utility effects of GDP per capita – that is, it is clear that 100 additional dollars for a person close to starvation provides more additional utility than 100 additional dollars for a millionaire. As a compromise, the most recent version of the HDI employs (as we do) the log of GDP per capita in order to account for those effects. Another issue is whether political freedom, human and gender-specific rights and capabilities, inequality, environmental quality etc. should also be included, and a number of extended HDI versions have been suggested. However, given scarcity of the historical data and a preference for simplicity, we will present the standard form of the HDI in the following, and discuss the stature indicator separately below (the only difference: our HDI is calculated on the basis of schooling only, not literacy plus schooling).

What were the major changes in educational spending during the interwar period?

Germany continued to have a strong educational sector in the 1920s, but the Nazis changed the contents in the 1930s to serve their political aims, making previous progress obsolete. The Soviet Union did pursue similar aims, but given the low level of public schooling before WWI, their record of educational achievements still looks impressive. Some of the previous parts of the Habsburg Empire, such as Hungary and western Romania, were not able to keep the level of primary schooling when they experienced serious economic crisis in the 1920s (see Lindert 2004 for a review). Finally, the Southern European world was quite divided. Italy, for example, achieved remarkable

progress in education (relative to low pre-WWI levels), but the Portuguese state did not invest much in education during the 1920s.

FIGURE 10.8

Looking at the year 1913, that is, before the wars and interwar distortions, we find a strong core-periphery structure in Europe (Figure 10.8). The group with the highest HDI values consisted of the UK, France, Germany, Austria, Switzerland, the Netherlands, Denmark and Sweden. The reasons for belonging to this group varied. In the UK, for example, a high GDP was the key element, Germany and France featured particularly well in education, and in Scandinavia life expectancy was quite high, compared with national income. Also high were the values for Hungary, Belgium, Ireland, Norway, the Czech and Slovak territories (they share one value, although Slovakia might have been in fact less developed). At the other extreme, the regions of the Russian and Ottoman Empires, as well as Portugal, performed badly, and the Balkans were also quite modestly developed. The historical change between this early core-periphery structure in 1913 and 1938 was dramatic (Figure 10.9). Of particular note is the rise of the Soviet Union – according to the statistics available, their education system developed rapidly, as the communist government aimed at requiring all children to attend school, and mortality declined dramatically. The increase in life expectancy and GDP, as recorded in the official statistics, was remarkable. Apart from the Soviet Union, other initially less developed countries such as Poland, others on the Baltic, Portugal, and to a lesser extent the Balkan countries and Turkey increased their HDI values, whereas the European core

made the smallest gains and in some cases even declined; Lindert (2004) argued that France had particularly high pre-war schooling values, and the country might have lost some educational coverage up to 1938.

FIGURE 10.9

We can conclude that GDP per capita and HDI showed signs of convergence within Europe during the interwar period. Eastern Europe in particular improved in welfare until 1938. But some rich countries such as Switzerland and Sweden also achieved substantial GDP growth. The change of the HDI in contrast shows some unequivocal convergence, which was to a large extent driven by educational efforts in the East.

6) Height as an Indicator of Living Standards 1914-45

The study of human stature is another approach to measuring welfare development. This concept has also been termed the “Biological Standard of Living”, as it tends to be correlated with most biological dimensions of welfare (such as health, life expectancy, and nutritional quality; see Komlos 1985, Steckel 1995). The height of any one individual tells us little about her/his well-being, as there is much genetic height variation between individuals. However, the average of a large number of height measurements can reveal much about the quality of nutrition and health. There is a large literature on these “anthropometric” welfare measurements, which uses a wide range of sources (for a global overview see Steckel/Floud 1998, Fogel 1986, Komlos and Baten 2004).

The amount of research by economic historians on height in the early 20th century is actually quite limited. We know more about the cycles of height during the 18th and 19th centuries, than about the early 20th century. This is understandable, given that for the 18th and 19th centuries other living standard indicators are in particular scarce supply (such as GDP per capita and real wage estimates). However, also for the interwar period of the 20th century, those indicators are problematic, as the Stalinist Soviet Union, Nazi Germany, and some of the war economies did regulate prices and wages, hence the purchasing-power-based indicators do not have much to say. Height research has many strengths and some weaknesses, but the largest value-added can be obtained if other welfare measures are unreliable or unavailable.

Previous research on the early 20th century focused strongly on Britain, for which Harris (1988) studied the development of school children during the years of high unemployment. On the Soviet Union, a number of studies have been published in a special issue of the *Slavic Review*. The interpretations of the Soviet anthropometric record are quite controversial. Wheatcroft (1999) finds a positive trend in the height of Central Russian male heights, and interprets this as a welfare improvement and success of communist policies. Quite the opposite, Komlos (1985) compares the Soviet height record with a number of other countries and finds that while the trend was positive, it was not impressive in international comparisons. Other countries, Komlos argued, performed much better. Given the global spread of hygienic and medical knowledge, small upward trends of height in this period can be indications of disappointing developments. Only a

comparison with a world-wide trend, which is not yet available, will yield a correct interpretation. Mironov (1999) aimed at explaining the positive height trend especially during the 1950s by the enormous reduction of fertility. He also suggests a number of adjustments to Wheatcroft's height record, given that a very large number of above-average Soviet soldiers died in WWII, which were biasing the early height estimates downward. Moreover, some older individuals were included among the early cohorts.

Turning to another undemocratic and inhuman regime of the time, Baten and Wagner (2003) studied the biological standard of living during the early Nazi period in Germany before WWII. They found that, in quite ironic contrast to the Nazi's insistence on tall Germanic body properties, the heights of German schoolchildren actually stagnated or slightly declined during the Nazi period, in contrast to other European countries. In a similar vein, life expectancies developed much less favourably than in France, the U.S., or other countries, and some diseases did spread much more than in other countries (diphtheria, for example, and most nutrition-related disease). The reason behind these developments was the disintegration of food markets in Germany due to autarchy and market interventions. Moreover, the investments in public health developed much slower than in other countries; even poorer countries such as Hungary started vaccination campaigns against diphtheria earlier and were more successful than Germany.

FIGURE 10.10

While those individual country studies are instructive, we need to discuss the broad picture for all of Europe. We first consider the time trends of height (in centimetres) in different European regions (Figure 10.10). It should be noted that those figures are interpolated to a considerable degree, therefore some short-term movements are not visible. But the broad trends and the degree of height growth yield substantive information.

Initially, in 1910-14, there was a “tall” group in Europe (Scandinavia, UK and Ireland), a middle group of Central, Southeastern, Eastern and Western Europe, and a “short” group of Southern European countries. The “tall” groups had a very favourable nutrition, which consisted of substantial amounts of protein and calcium (contained in milk, for example), and a high educational standard. In general, heights trended upward in all of Europe during the early 20th century, but the slope is somewhat different in different regions. The least growth can be found in the Southeast and the British Isles. The UK and Ireland together fell clearly back into a middle group, and Southeastern Europe fell from the middle group to the second-shortest height group. Southern Europe converged upward, as nutrition, education and health improved. What are the reasons for this development? Well, clearly the UK lost the prominent position as the “workshop of the world” during the early 20th century. Moreover, the UK was the world’s largest food importer in the pre-war period, and it might have suffered considerably from the great trade disruptions during periods of war and depression. The Balkans on the other hand had initially a fairly good nutrition (relative to their low income) from subsistence farming in the remote mountains of Bulgaria, Montenegro, and Albania, but the strong population growth and

slow productivity change ate up each initial advantage. The Scandinavian countries were among the leaders in developing the classical European welfare state, which had quite a positive impact on the health of poorer strata of society. Whilst stature did not decline in eastern Europe, it did not show much convergence with Scandinavia or other countries with more favourable anthropometric values. The development of the Soviet Union dominates the estimate for Eastern Europe. While growing stronger than the Balkans, East European stature development was not exceptionally strong. The positive effects of the communist schooling efforts, which showed up in the discussion of the HDI above, cannot be found in the pre-1950 height record. However, this cannot be simply attributed to communist economic development. The German armies which invaded the Soviet Union in 1941 also destroyed much of the capital stock and other growth components.

Other interesting developments which can be seen in this figure are the modest Southern European height development until 1940 -- probably influenced by the civil war in Spain, among other factors. In a similar vein, the socialist and communist experiments also contributed after 1945 to the poor development in Southeastern Europe. Together with the Southern Europeans, they became the shortest in Europe, but Southern Europe started to improve its position. In central Europe, Germany faltered from its long-run growth trend during WWI and its aftermath, whereas the nutritional problems of the 1930s and 1940s are not visible in the maps (perhaps due to the catch-up growth during the early post-war period, or imprecise estimates).

Even as late as the early 20th century, the proximity to protein (cattle, milk etc.) explained a lot of the variation of height, because those who lived close to this kind of agricultural specialization could consume the bottleneck factors of protein and calcium at relatively low prices. In Scandinavia, for example, this proximity advantage was strong, even if income was not as high as in England.

FIGURE 10.11

During the interwar years, income also became important for height, and protein proximity lost its significance for longevity. Hence there is a gradual switch from protein proximity to income and other factors (such as public health) over time as determinants of biological welfare. Was there convergence in heights, 1910-35? Interestingly, in the period of market disintegration 1910-35, there was divergence rather than convergence in heights (Figure 10.11). As the economies did not export as much of their staples of comparative advantage anymore, consumption temporarily increased in those countries of high protein supply, whereas it declined in the Mediterranean economies. The picture is much more mixed when we move from the late interwar period to the 1950s: Some countries of initially lower heights, such as Greece, Russia, and Spain, started to improve considerably, whereas Sweden and Norway had lower than average growth. But there were also counter-examples on both sides, such as Denmark and the Netherlands among the initially tall nations. Most notably, Turkish heights did not increase at all, in spite of the large scope for catching-up.

7) Conclusions

The 1914-45 period will be remembered mostly for the devastations of two World Wars, the collapse of major imperial systems, a major economic depression and civil wars in Russia and Spain. Research studies show how these disasters had major short run effects on incomes and, where income data are unreliable as in Nazi Germany and Soviet Russia, new indicators of stature reveal the stagnation of living standards. In this light, the fact that over the whole 40 years, population rose by nearly 100 million, income per head by over 25% and average individual height by more than 4 centimetres was remarkable. European society seems to have had strong powers of recovery; after each conflict and population displacement there was an early resumption of long term trends. Indeed the macro movements in population and incomes were perhaps less important than some of the more qualitative dimensions of living standards – life expectancy, family size, literacy, education - and changes in the structure of economies wherein industrialisation promoted major economic migrations from agriculture to industry, from villages to towns, from the poorer agricultural economies of southern and eastern Europe to western European industrial regions.

The Human Development Index records major advances in this period with a distinct convergence of eastern and southern Europe towards the levels in north-western Europe. Income growth was not the most important underlying factor. Much more important was how incomes were spent and how governments intervened. Infant mortality fell dramatically and was a major element in life expectancy rising by about 40%, a product mainly of public health expenditures, better housing and a mushrooming of counselling

and support for mothers and child care. Knowledge of the key parameters was being spread throughout eastern and southern Europe who were able to catch up. The fall in infant mortality persuaded mothers to have less births, a trend enhanced by the large fall in the share in the economy of those sectors, like agriculture, which traditionally used much child labour, and by the significant rise in the labour market participation of females which, in conjunction with the increased training needs of children, raised the opportunity cost of having children. The eastern and southern European countries which were able to catch up with Northern and Western Europe experienced a greater decline in the share of the traditional sectors, a major distinguishing feature of this period.

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TABLE 10.1

BIRTH RATES 1890-1939
(births per 1000 population)

	<u>1890-9</u>	<u>1900-9</u>	<u>1920-9</u>	<u>1930-9</u>
Norway	30.1	27.9	21.0	15.4
Scotland	30.3	28.7	22.3	18.1
Spain	34.8	34.4	26.7	23.1
Bulgaria	38.8	41.4	36.9	27.2
Russia (in Europe)	49.3	47.2	39.4	35.3

Source: Mitchell, 1998

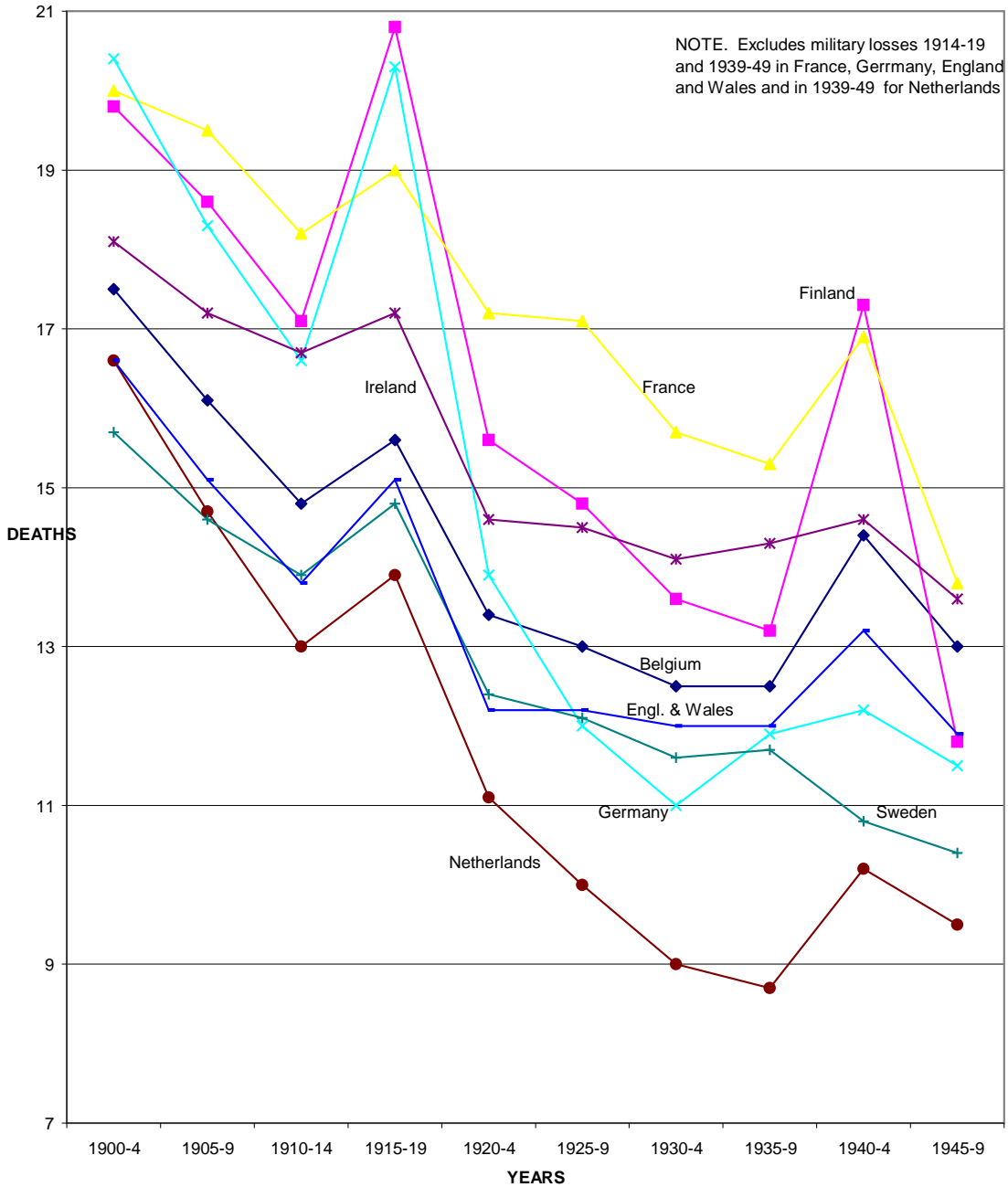
TABLE 10.2
OVERSEAS EMIGRATION FROM EUROPE 1901-50
(annual average '000 persons)

	1901-10	1911-20	1921-30	1931-40	1941-50
Italy	361.5	219.4	137.0	23.5	46.7
Britain & Irel.	315.0	258.7	215.1	26.2	75.5 ^a
Austria	111.1 ^b	41.8 ^b	6.1	1.1	na
Spain	109.1	130.6	56.0	13.2	16.6
Russia	91.1	42.0	na	na	na
Portugal	32.4	40.2	99.5	10.8	6.9 ^c
Sweden	32.4	8.6	10.7	0.8	2.3
Germany	27.4	9.1	56.4	12.1 ^d	61.8 ^c
Poland	na	na	63.4 ^f	16.4 ^g	na
Norway	19.1	6.2	8.7	0.6	1.0 ^a
Finland	15.9	6.7	7.3	0.3	0.7
Denmark	7.3	5.2	6.4	10.0	3.8
France	5.3	3.2	0.4	0.5	na
Switzerland	3.7	3.1	5.0	4.7	1.8 ^h
Belgium	3.0	2.1 ⁱ	3.3	2.0	2.9
Netherlands	2.8	2.2	3.2	0.4 ^d	7.5 ^a

a) 1946-50 b) Austria-Hungary c) Includes emigration to European countries 1941-9
 d) 1932-6 e) West Germany f) Incomplete data g) 1931-8
 Includes emigration to European countries 1941-4 i) Excludes 1913-18

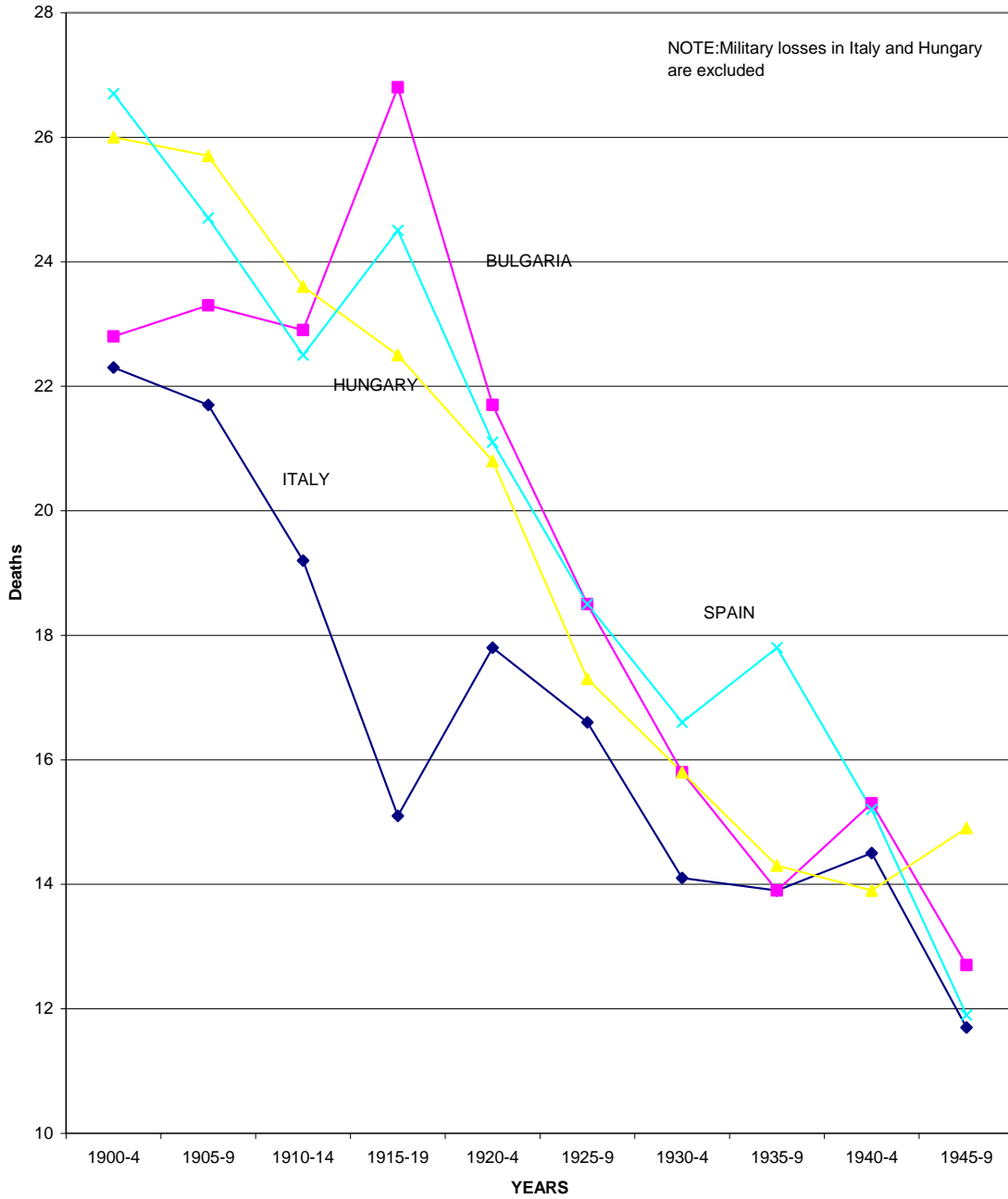
Source: Mitchell 1998.

FIGURE 10.1: MORTALITY IN NORTHERN AND WESTERN EUROPE 1900-1949 (contemporary boundaries: number of deaths per 1000 population)



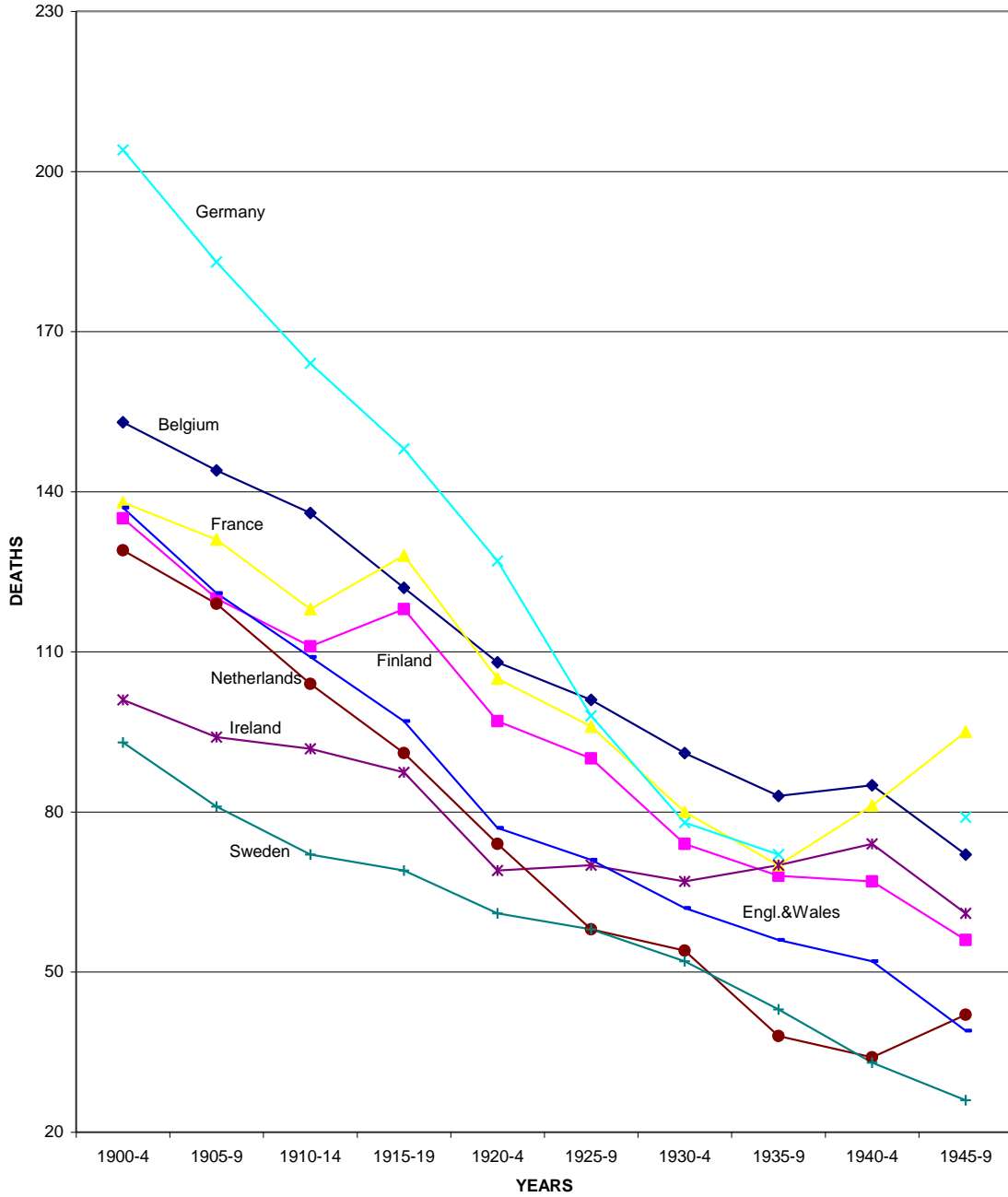
Source: Mitchell, 1976, 1998.

FIGURE 10. 2: MORTALITY IN SOUTHERN AND EASTERN EUROPE 1900-1949 (contemporary boundaries: number of deaths per 1000 population)



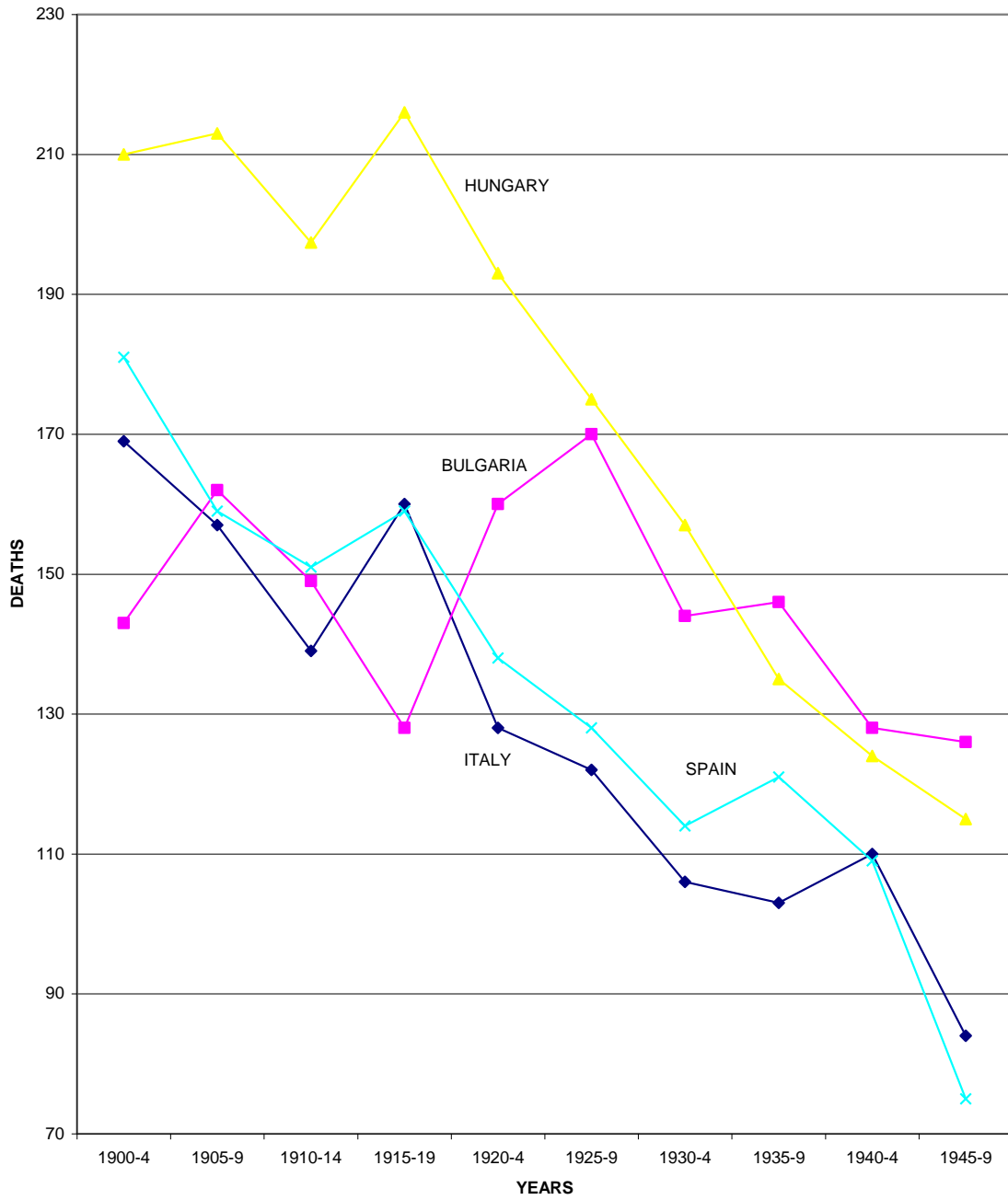
Source: Mitchell 1976, 1998.

FIGURE 10.3: INFANT MORTALITY IN NORTHERN AND WESTERN EUROPE 1900-1949
 (contemporary boundaries: number of deaths of infants under one year, per 1000 live births)



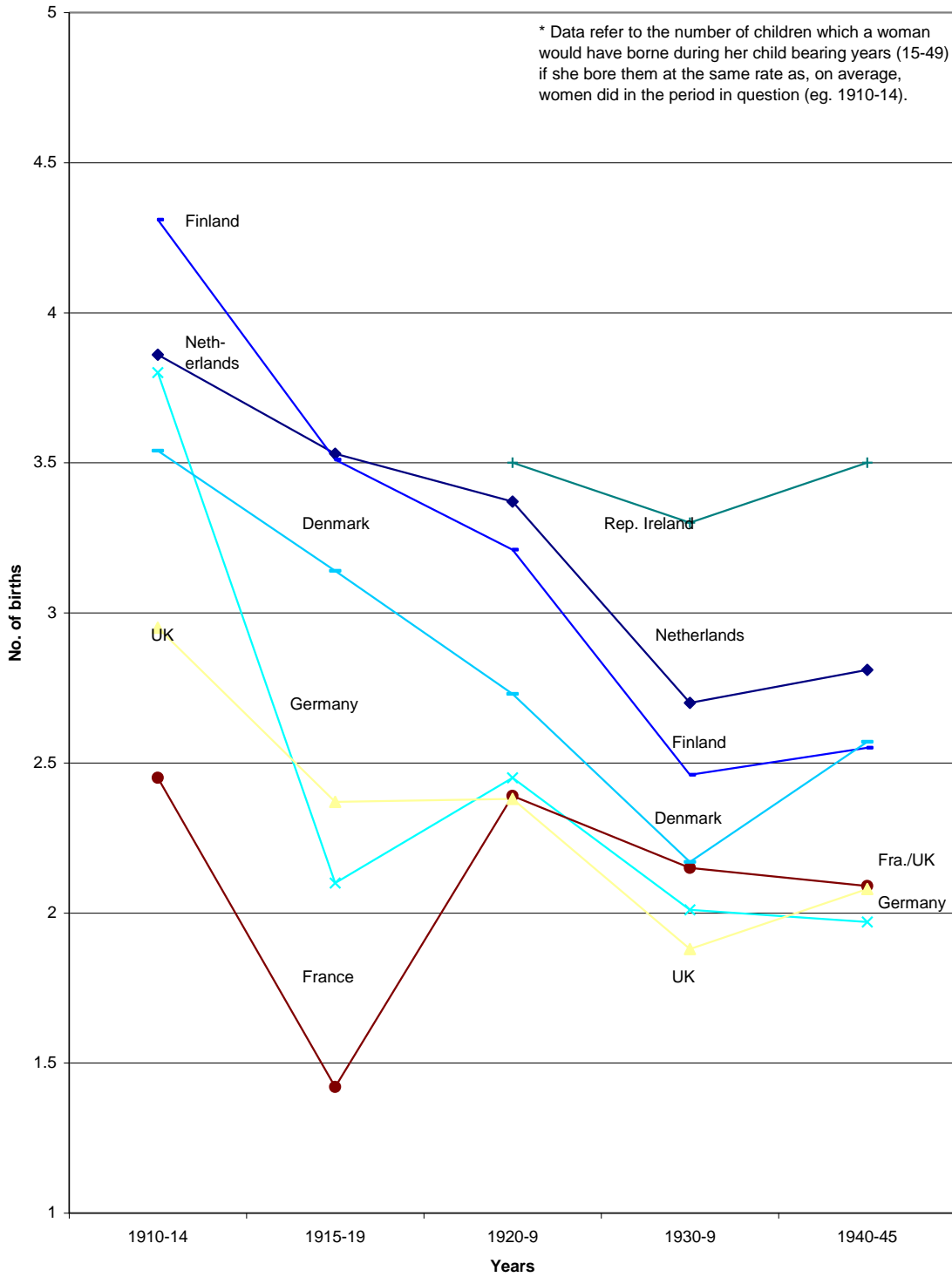
Source: Mitchell 1976, 1998.

FIGURE 10.4 : INFANT MORTALITY IN SOUTHERN AND EASTERN EUROPE 1900-1949
 (contemporary boundaries: number of deaths of infants under one year, per 1000 live births)



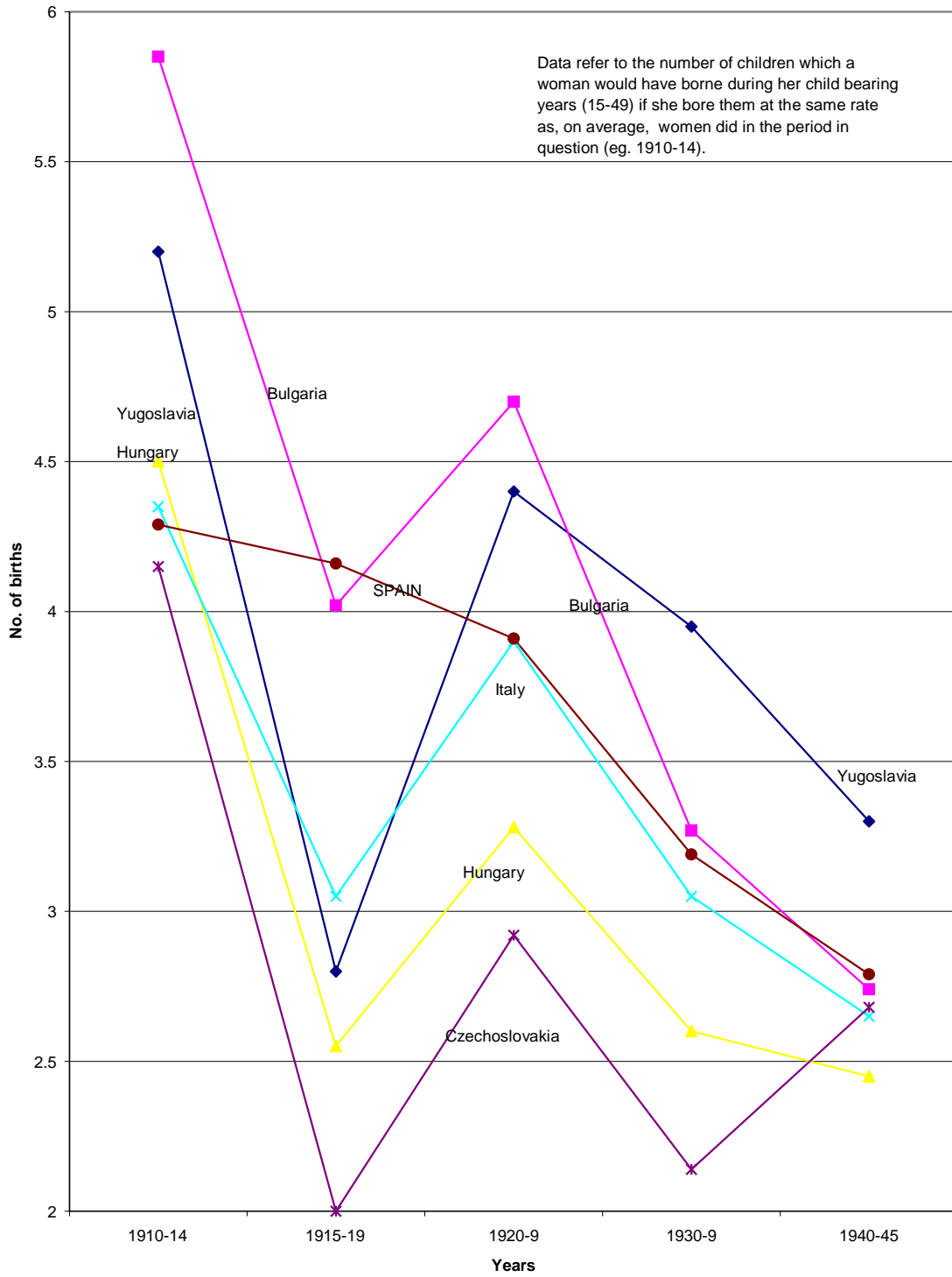
Source: Mitchell 1976, 1998.

FIGURE 10.5: FERTILITY IN NORTHERN AND WESTERN EUROPE 1910-45 (contemporary boundaries; average number of births per woman aged 15-49)*



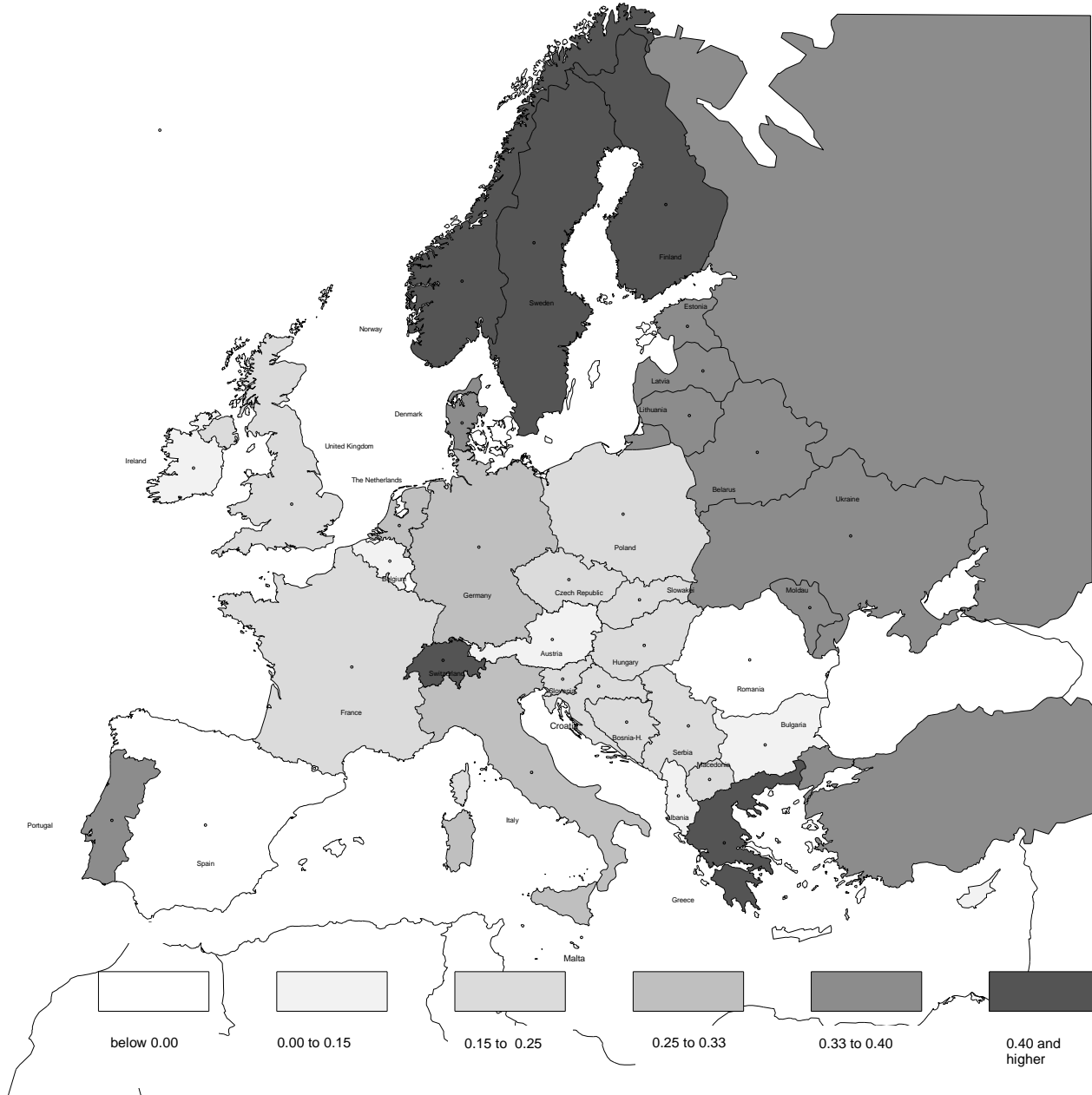
Source: Chesnais, 1999, p.106. The entries for Rep. of Ireland and the UK 1910-14 (which excludes S.Ireland) are estimates.

Figure 10.6: Fertility in Southern and Eastern Europe 1910-45 (contemporary boundaries; average number of births per woman aged 15-49)



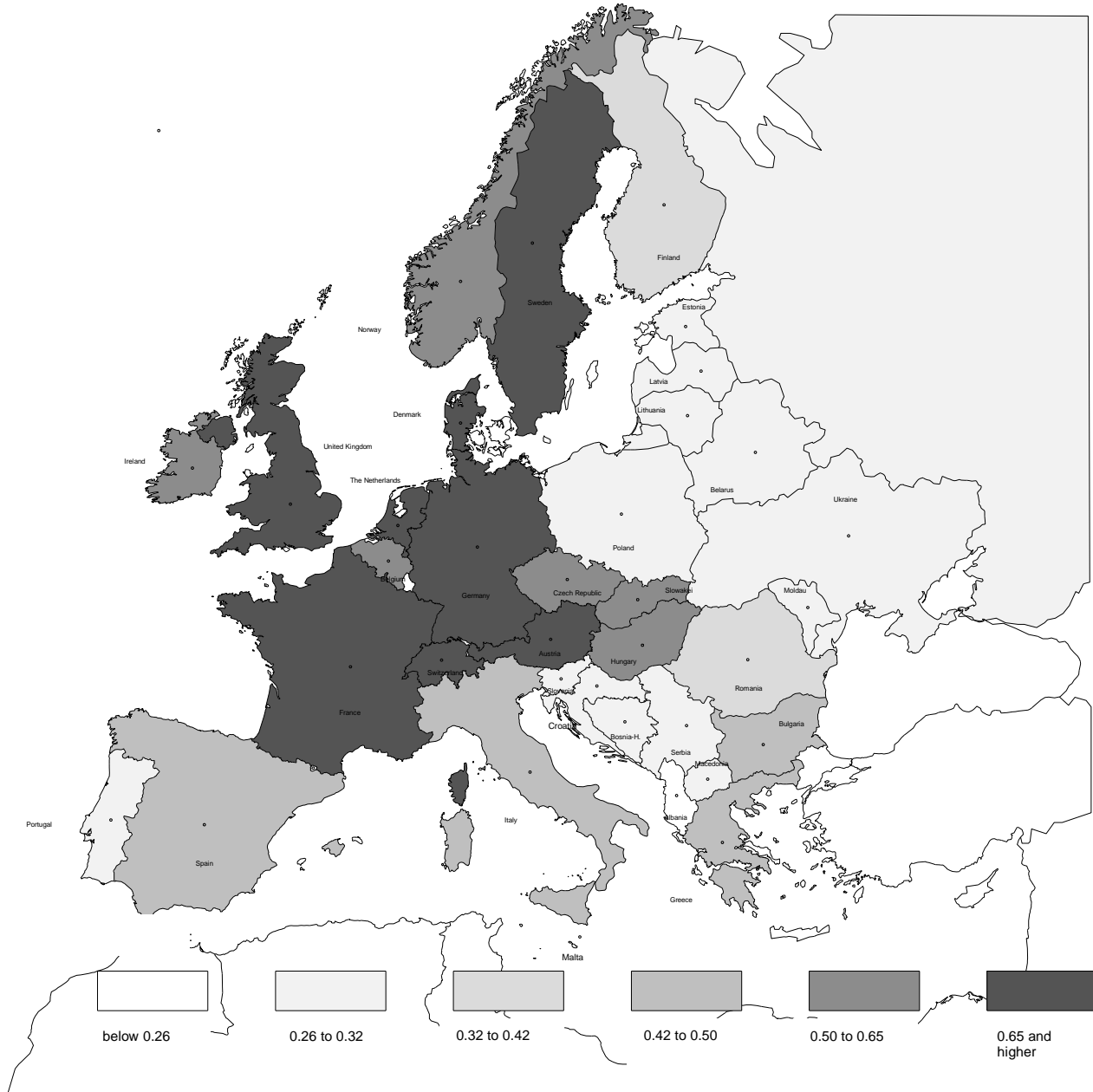
Source: Chesnais 1999, p.106. The entries for Czechoslovakia 1914-19, Italy 1910-39 and Yugoslavia 1910-19 and 1940-5 are estimates.

Figure 10.7: Change of GDP per capita in European countries, 1913-1938



Note: values are expressed as HDI component, see text. Calculated from Maddison 2001; on Germany, see Ritschl and Spoerer 1997.

Figure 10.8: Level of HDI in European countries, 1913



Sources: see text

Figure 10.9: Change of HDI in European countries, 1913-1938

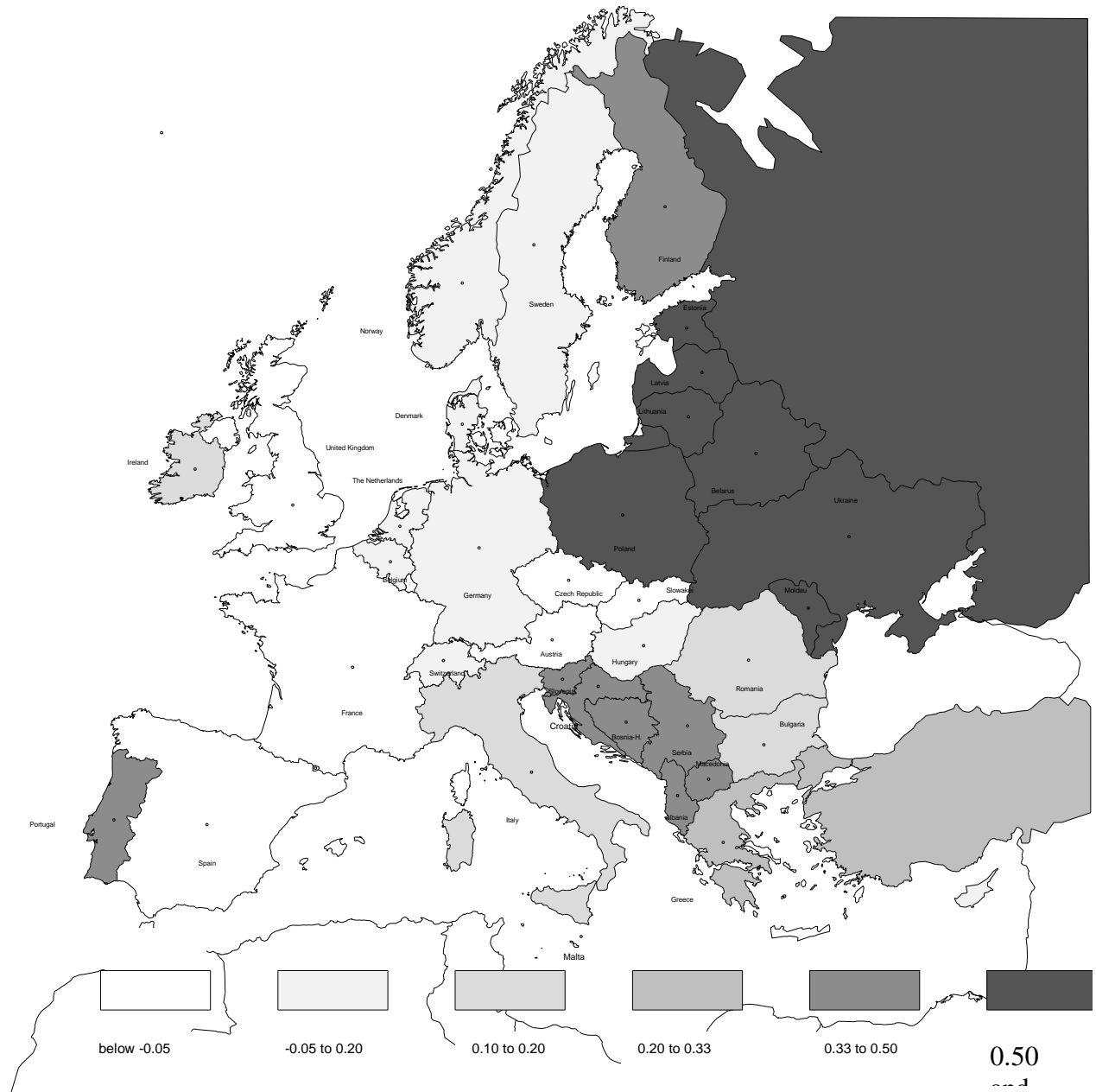
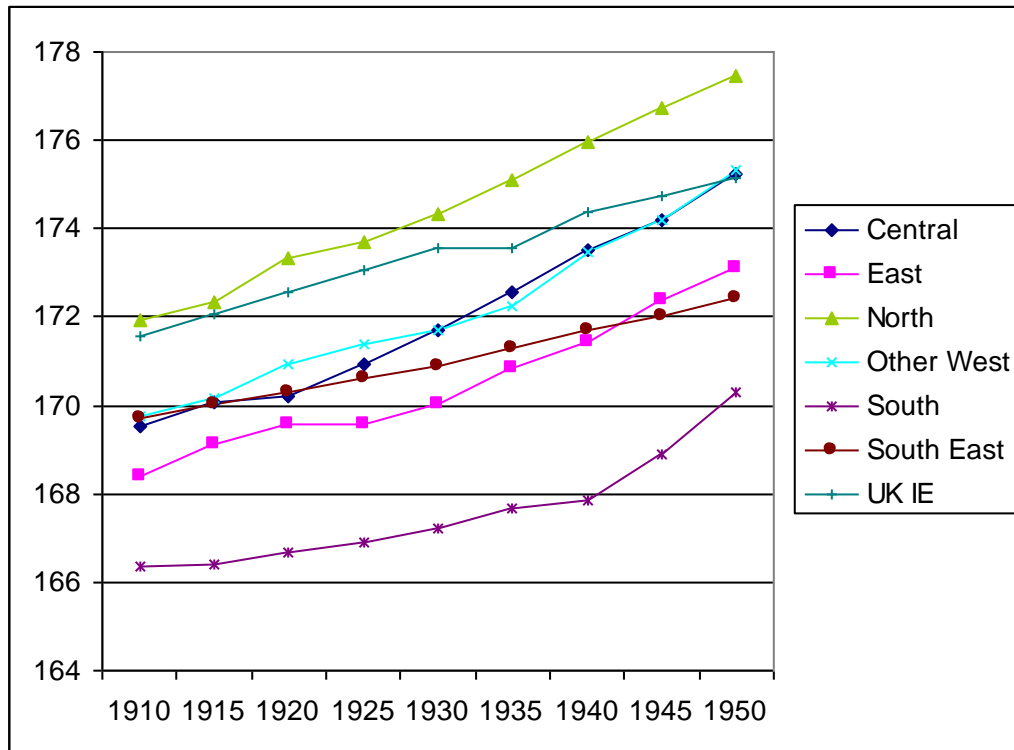


Figure 10.10: Heights in European countries, 1910-1950 (in centimetres)



Source: Baten, 2006.

Definitions:

The years on the horizontal axis are the start years of a five-year birth period.

North=DK Denmark, SE Sweden, NO Norway, FI Finland;

UK IE: UK and Ireland;

South: CY Cyprus, GR Greece, IT Italy, ES Spain, PT Portugal;

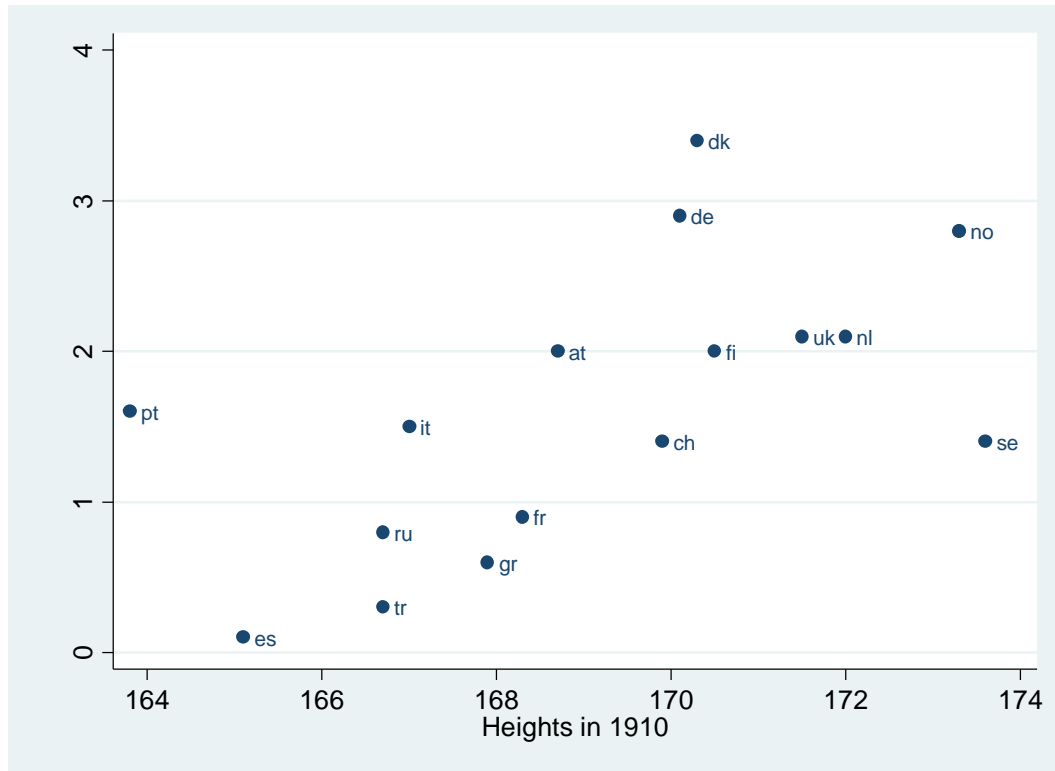
South East: AL Albania, BG Bulgaria, RO Romania, YU Yugoslavia;

Central: DE Germany, AT Austria, CH Switzerland;

East: CZ Czech Republic, HU Hungary, PL Poland, SK Slovakia, and previous Russian Empire countries RU;

Other West: NL Netherlands, BE Belgium, FR France;

Figure 10.11: Height level ca. 1913 and height change ca. 1913-38 (in centimetres)



Note: Country abbreviations are explained below Figure 10.10