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EDUCATION LEVEL OF THE LUXEMBOURG POPULATION: sustained, contrasting growth depending on origin

Louis Chauvel, Etienne Le Bihan, Geoffrey Caruso, Yann Ferro, Kerry Schiel, Isabelle Pigeron-Piroth
(University of Luxembourg), Frédéric Docquier (LISER)

STATEC

Institut national de la statistique
et des études économiques


UNIVERSITÉ DU
LUXEMBOURG

 LISER
LUXEMBOURG INSTITUTE OF
SOCIO-ECONOMIC RESEARCH

Summary

A key indicator of human development and socio-economic progress, the level of education of the resident population has risen rapidly over the intercensal period 2011-2021: almost half (48.3%) of adults under 40 have a tertiary education (28% of whom have a Master's degree or higher). These changes conceal differences between Luxembourg-born and foreign-born people, major inequalities between immigrants according to their national origin, between "golden immigration" and immigration for low-skilled work, and also major generational disparities. These inequalities in qualifications are a feature of Luxembourg's territory, as they accompany the effects of centrality that set the most economically active areas, close to the capital, against the more remote communes, particularly in the northern half of the country, but also in the post-industrial south.

Education is an essential pillar of a country's prosperity and economic, social and political development. Promoting or democratising access to education enables individuals to benefit from better employment and salary opportunities, and to progress socially (Bertrand et al., 2021). Education is also a vehicle for social cohesion, fostering mutual understanding and tolerance between cultures and social groups, as well as raising awareness of environmental and public health issues (Raghupathi and Raghupathi, 2020; Sola 2014). In economic terms, a better-educated workforce is generally more productive and innovative, which boosts the local economy by attracting foreign investment, stimulating technical progress and making it easier to adapt to change (Hanushek and Woessmann, 2008, 2021). In short, education contributes to prosperity, stability and long-term growth.

Methodological insert: Study population and measurement of education level

This publication describes the level of education of residents aged 15 and over at the time of the 2021 census who are no longer in education. This level is measured by the highest qualification obtained. 541,367 people born in almost 200 different countries were aged 15 and over and living in Luxembourg at the time of the census. However, 154,292 of them (28.5%) did not indicate their level of education and 40,187 people (8.7%) were still studying. Our analysis is therefore based solely on the data obtained after eliminating these individuals who were still studying and those whose level of education was not provided. Our population of interest therefore comprises 346,888 residents aged 15 and over, for whom the census distinguishes eight categories of education, grouped here into four main groups: (i) holders of a university Master's degree or doctorate (referred to as Master's degree and above), (ii) holders of a Bachelor's degree/Licence or short higher diploma

(referred to as Bachelor's degree and short higher diploma), (iii) holders of an upper secondary diploma, and (iv) individuals with lower levels of qualification (referred to as lower secondary and below). It is important to remember that the many cross-border workers active in Luxembourg are not taken into account in the census, which only covers people who have their place of residence in the country.

Holders of a Master's degree or higher represent 20.7% of the population studied, compared with 16.5% for holders of a Bachelor's degree or short higher diploma, 37.0% for upper secondary school graduates, and 25.8% for the least educated (Table 1). In the remainder of this publication, we analyse the level of education according to the origin of the population, as well as changes between the last two censuses, highlighting the effects of age, origin and generation. The final section presents an analysis of differences in residential location according to the educational level of the population.

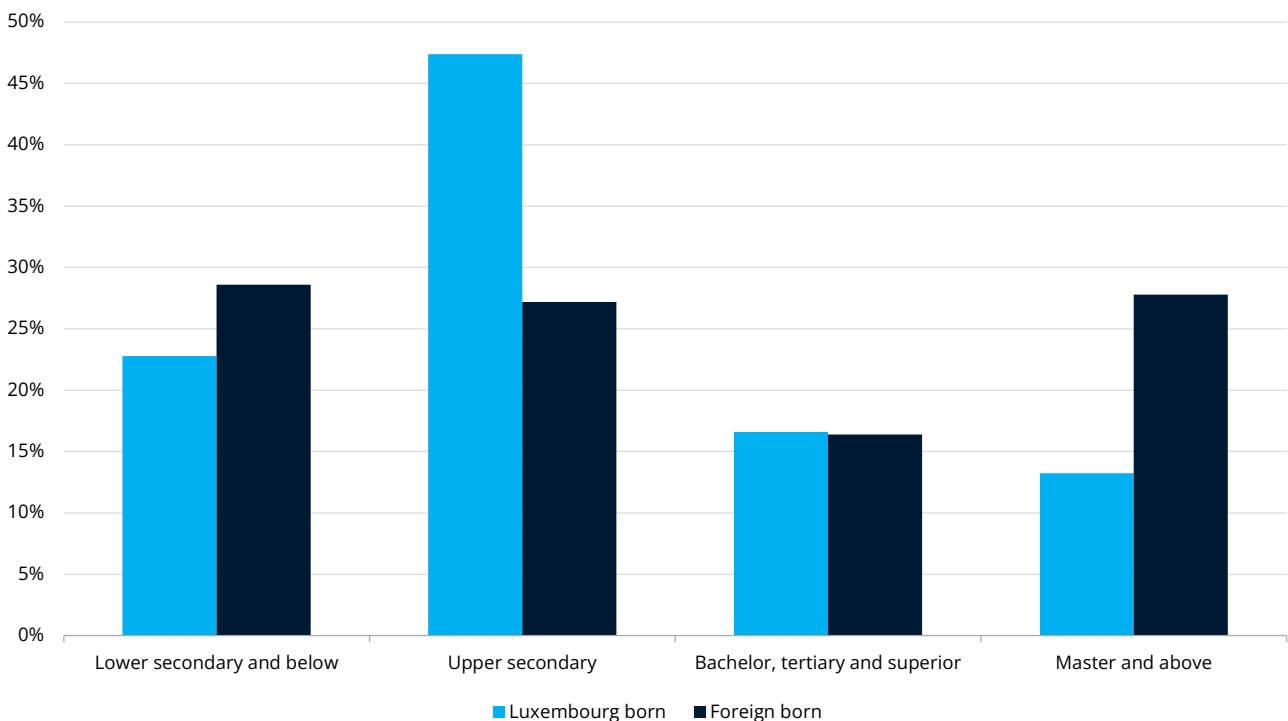
1. Population distribution by level of education and origin in 2021

In a country where almost half the total population was born abroad, it is interesting to compare the educational structure of the Luxembourg-born and foreign-born populations. These differences are illustrated in Figure 1.

Individuals born in Luxembourg represent 48.7% of the respondent population. Of these, 47.4% had completed upper secondary education (i.e. upper secondary level), placing the native-born population in the middle of the education distribution (Figure 1). Nearly a quarter of the population born in Luxembourg has a lower secondary qualification or less (22.8%). In contrast, Luxembourg-born holders of a Bachelor's degree or higher represent 16.6% of the population, and 13.2% of the native-born hold a Master's degree or doctorate.

51.3% of respondents were foreign-born. These immigrants are more represented at the extremes of the degree distribution. The least educated make up 28.6% of this population, while 27.8% have a Master's degree or higher (14.6 percentage points more than the native-born). Foreign-born people make up the bulk of the highly educated workforce in Luxembourg. In contrast, upper secondary school graduates represent only 27.2% of the immigrant population (i.e. 20.2 percentage points less than the native-born population). It is important to point out here that people born abroad are younger than those born in Luxembourg, and the age structure has an effect on the level of qualifications (as we shall see in the last part of this publication).

Figure 1: Breakdown of the population aged 15 and over by level of education and origin in 2021



Source: STATEC, RP2021

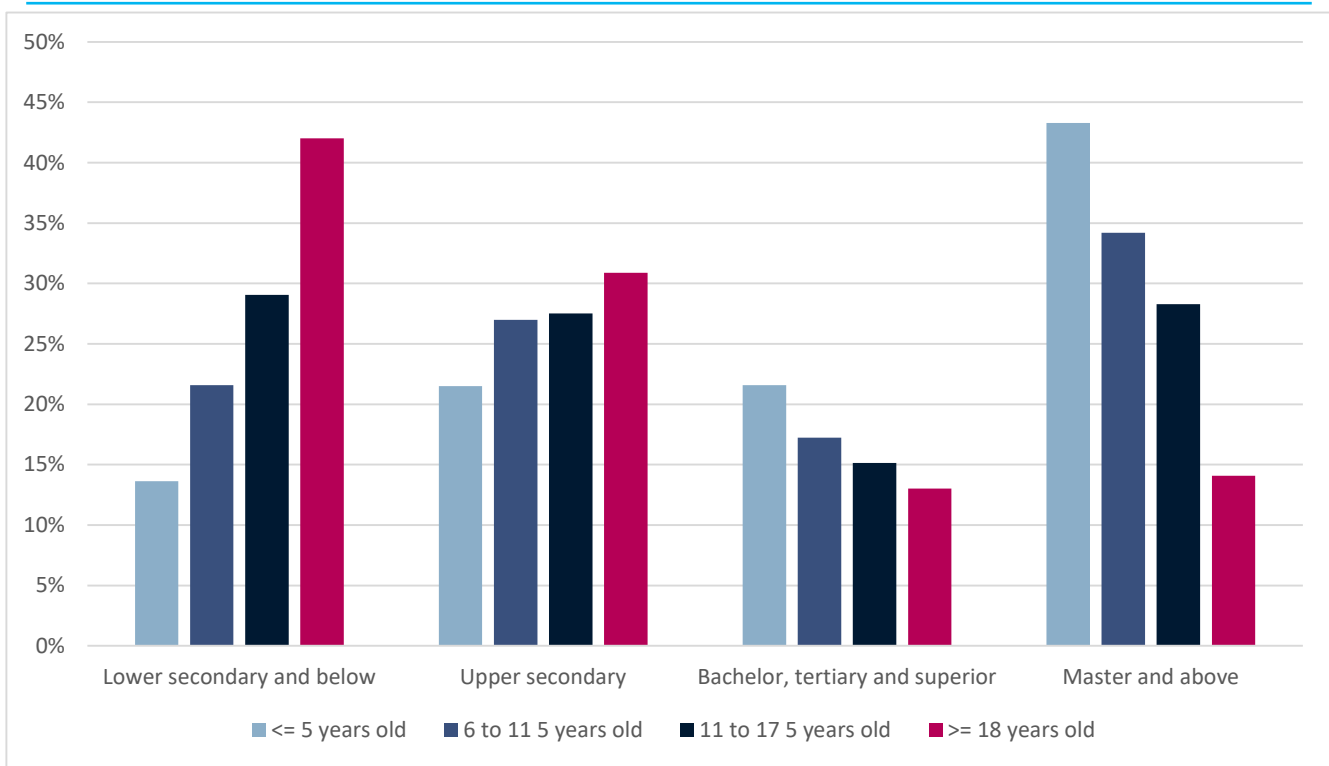
Note: this graph relates only to people aged 15 and over who have completed their studies and given their level of education.

Note for the reader: in 2021, among people aged 15 and over born abroad who have completed their studies and given their level of education, 27.8% have a Master's degree or higher, compared with 13.2% of those born in Luxembourg.

The differences are even more marked when we focus on immigrants who have recently arrived in Luxembourg (Figure 2). The proportion of those with a Master's degree or higher is 43.3% for immigrants who arrived in the last five years, and 34.2% for those who have been resident in Luxembourg for six to eleven years. In these two groups, the proportions of poorly educated people are 16.3% and 21.2% respectively. Immigrants who have been in the country for more than 18 years, on the other hand, include a large proportion of poorly educated people (42.0%) and a proportion of Master's or doctorate holders (14.1%) who are higher than the native-born average, but much lower than that of recent immigrants.

This underlines the differences in the profiles of the latest waves of immigration compared with the oldest. Behind these differences in entry cohorts also lie differences in age composition, which will be analysed in the second part.

Figure 2: Breakdown of the foreign-born population aged 15 and over, by level of education and length of stay in Luxembourg in 2021



Source: STATEC, RP2021

Note: this graph relates only to people aged 15 and over who have completed their studies and given their level of education.

Note for the reader: in 2021, among people aged 15 and over who have completed their studies, were born abroad and arrived no more than 5 years ago, 43.3% have a Master's degree or higher, compared with 14.1% of those who arrived 18 years ago or more.



The level of education of the foreign-born population varies greatly depending on the region or country of birth. Existing studies show that the average level of education of immigrants increases with the level of development of the country of origin, but also according to the geographical distance between countries, the absence of historical links with the country of origin, or the need to obtain an entry visa (Beine et al., 2011; Grogger and Hanson, 2011; Bertoli and Ruysen, 2018). In Table 1, three groups of countries of birth are distinguished: the three countries bordering Luxembourg, the other countries of the European Union of 27 (EU27), and the other non-EU countries. Within these three groups, the education levels of the countries of origin most represented in the population aged 15 and over (top 20) are detailed.

The highest proportions of people with a Master's degree or higher are found among people born in neighbouring countries where the level of human capital is high (40.8%), followed by non-European

countries (26.0%) and the rest of the EU27 (21.0%). These percentages are much higher than those observed among natives (13.2%). Within these groups, there are marked differences between countries of birth. For example, the proportion of highly-qualified people (Master's degree and above) is low among those born in Portugal, and among nationals of Cape Verde, Montenegro and Bosnia. The proportion is high for people born in Spain, Poland and Greece in the EU27, and in India, Russia and the United States in non-EU27 countries.

Among the least educated, the lowest shares are observed among people born in neighbouring countries, but also in India, Russia, the United States and the United Kingdom, as well as in certain EU27 countries, with the exception of Portugal (65.2%) and Italy (30.9%). Finally, residents born in Luxembourg are clearly over-represented among upper secondary school graduates. The only comparable countries in this respect are Montenegro and Bosnia.



**Table 1. Breakdown of the population aged 15 and over by level of education in 2021
(by region and main countries of birth)**

(Countries and region of birth)	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above	Total
Luxembourg	22.8%	47.4%	16.6%	13.2%	100%
Foreign born	28.6%	27.2%	16.4%	27.8%	100%
Including border countries	10.0%	27.9%	21.3%	40.8%	100%
<i>including France</i>	8.9%	25.7%	19.8%	45.6%	100%
<i>including Belgium</i>	9.6%	25.7%	27.1%	37.5%	100%
<i>including Germany</i>	13.1%	35.7%	17.4%	33.8%	100%
Including others EU27 countries	44.3%	24.4%	10.3%	21.0%	100%
<i>including Portugal</i>	65.2%	26.6%	4.8%	3.4%	100%
<i>including Italy</i>	30.9%	25.4%	11.3%	32.3%	100%
<i>including Spain</i>	14.0%	12.7%	21.1%	52.1%	100%
<i>including Romania</i>	6.4%	25.9%	24.1%	43.5%	100%
<i>including Poland</i>	7.0%	24.1%	13.2%	55.7%	100%
<i>including Netherlands</i>	14.5%	35.5%	22.6%	27.4%	100%
<i>including Greece</i>	2.2%	10.5%	21.5%	65.7%	100%
Including non EU27 countries	22.5%	30.6%	20.9%	26.0%	100%
<i>including Cape Verde</i>	58.4%	34.1%	5.4%	2.1%	100%
<i>including United Kingdom</i>	2.6%	23.8%	39.9%	33.6%	100%
<i>including Brazil</i>	21.9%	32.5%	25.2%	20.4%	100%
<i>including China</i>	19.1%	32.3%	17.9%	30.8%	100%
<i>including India</i>	2.8%	9.7%	31.6%	56.0%	100%
<i>including Republic of Montenegro</i>	42.1%	46.6%	8.3%	3.1%	100%
<i>including Morocco</i>	19.1%	32.3%	17.9%	30.8%	100%
<i>including Bosnia</i>	25.9%	53.9%	11.1%	9.0%	100%
<i>including Russian Federation</i>	1.8%	14.4%	20.1%	63.8%	100%
<i>including United States of America</i>	2.1%	11.0%	38.6%	48.4%	100%
Total	25.8%	37.0%	16.5%	20.7%	100%

Source: STATEC, RP2021

Note: The rankings in brackets correspond to the 20 countries of origin most represented among people aged 15 and over who have completed their studies and given their level of education.

These findings from the 2021 census confirm the existence of marked differences, particularly within the immigrant population, highlighting forms of specialisation in the labour market, where the countries of origin of less skilled workers (Portugal, Cape Verde, Montenegro, in particular) contrast with the countries of origin of the so-called 'golden immigrants' (Fehlen et al., 2009) employed in particular in financial services and institutions. The following sections take a closer look at these findings by analysing changes over time and variations within Luxembourg.

2. Education levels: sustained growth (2011-2021)

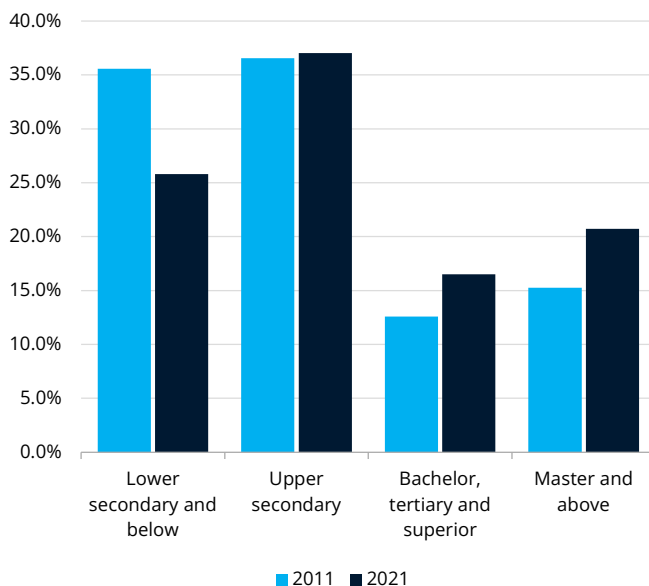
2.1 The proportion of higher education graduates has risen by more than a third since 2011

Over the intercensal period 2011-2021¹, the level of education of the resident population has risen sharply in ten years. Among residents aged 15 and over who are no longer in education and who indicated their level of education, the proportion of tertiary graduates (Bachelor's degree and higher + Master's degree and above) rose from 27.9% to 37.2%, representing an increase of 9.4 percentage points and a relative increase of 33.6%, which is considerable (Table 2 and Figure 3).

In detail, it is the long tertiary graduates in particular who are driving the trend, since the proportion of holders of a Master's degree or higher has increased by 35.8% in relative terms, and that of holders of a Bachelor's degree or higher by 31.0%, which is only slightly less.

At the opposite end of the degree hierarchy, the proportion of residents with less than upper secondary education declined from 35.6 to 25.7% of the population. At the intermediate level of qualifications, the proportion of residents with upper secondary education (typically baccalaureate and equivalent) remains stable at around 37% of the respondent population.

Figure 3: Education level of the population in 2011 and 2021



Source: STATEC, RP2011, RP2021

Note: this graph concerns people aged 15 and over who have completed their studies and have indicated their level of education.

¹ For more details on the 2011 results: PELTIER, F., THILL, G., HEINZ, A., Niveau d'éducation de la population du Grand-Duché de Luxembourg, Statec; 2013: <https://statistiques.public.lu/fr/publications/series/RP-2011---Premiers-resultats/2013/rp11-19-13.html>

Table 2. Education level of the population by gender in 2011 and 2021

Level of education	2011		2021		Difference (in % points)		% relative change	
	Men	Women	Men	Women	Men	Women	Men	Women
Lower secondary and below	33.2%	37.9%	24.1%	27.4%	-9.14	-10.51	-27.5%	-27.7%
Upper secondary	36.3%	36.9%	37.6%	36.4%	1.33	-0.42	3.7%	-1.1%
Bachelor, tertiary and superior	13.4%	11.8%	16.1%	16.9%	2.73	5.08	20.4%	43.0%
Master and above	17.1%	13.4%	22.2%	19.3%	5.08	5.84	29.7%	43.5%
Total	100.0%	100.0%	100.0%	100.0%				

Source: STATEC, RP2011, RP2021

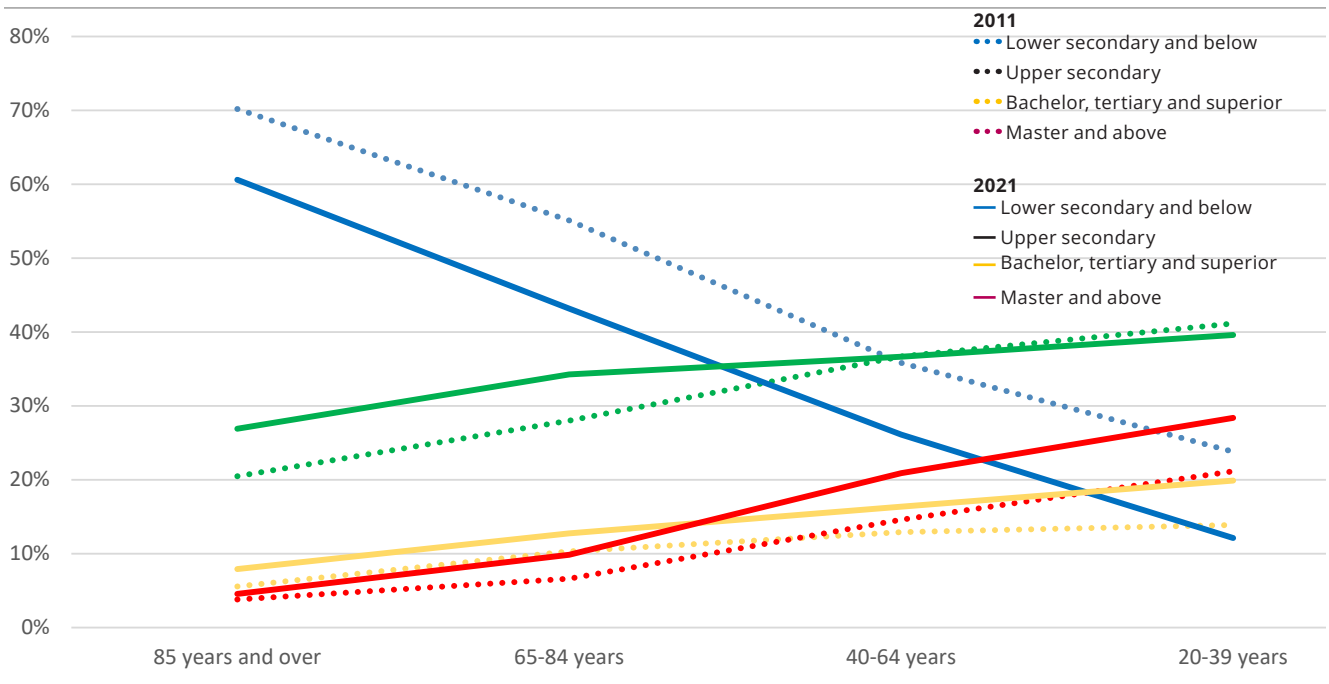
Note: this table refers to people aged 15 and over who have completed their studies and have indicated their level of education.



A comparison of women and men shows that, in higher education, women are rapidly catching up with their historical lag (Table 2): in 2021, the proportion of men who have reached Master's level and above is 22.2% and 19.3% for women, compared with 17.1% and 13.4% respectively ten years earlier: the gap has narrowed by a third. At Bachelor's level and above, the gaps have reversed, to the advantage of women. This phenomenon is known and documented in a large number of countries (Bar-Haim et al 2022).

The contrast in levels of qualifications by age group testifies to the depth of the transformations: in 2021, 60% of residents aged over 85 will hold a lower secondary qualification or less, compared with just 12.1% of people aged 20 to 39 (Figure 4). Holders of higher education qualifications will account for just 12.5% of the over 85s in 2021, compared with 48.3% of the under 40s. This is a considerable change, since 60 years ago, the baccalauréat was the entry level to the salaried middle classes, whereas today, young people who stop at the baccalauréat are below the average for their generation, and can therefore no longer envisage employment at the same socio-economic level.

Figure 4: Level of education by age in 2011 (dotted line) and 2021 (solid line)



Source: STATEC, RP2011, RP2021

Note: this graph concerns people aged 20 and over who have completed their studies and have indicated their level of education.

The curves in Figure 4 confirm that, in 2021, among higher education graduates aged under 40, the proportion holding a Master's degree and above (28.4%) will exceed the proportion leaving their studies at Bachelor's level and above (19.9%): the highest levels of qualification have seen stronger growth among young people, in line with the demand for increasing qualifications from the country's businesses. This means that almost half of the generation aged 39 and under is now in higher education.

This dynamic is partly the result of the native population studying longer, and partly the result of strong migratory flows already highlighted in previous publications². This process will be analysed in more detail later in the text.

2.2 Level of education and origin: heterogeneity and change

The gaps between Luxembourg residents and foreigners have tended to widen: among Luxembourgers, the proportion with a Master's degree or higher rose from 11.0 to 15.3% between 2011 and 2021, an increase of 4.3 points; among foreigners, the increase was 6.8 points, from 21.5 to 28.3% (Table 3). In 2021, the most common level of education among people of Luxembourg nationality will be upper secondary education (in other words, the baccalaureate diploma) for 45.3% of Luxembourg nationals, compared with 25.5% of foreigners. Between 2011 and 2021, this specificity has increased. In comparison, foreigners are more represented at the two extremes of the degree distribution, particularly at Master's level and above.

² See RP2021 Premiers Résultats, no. 6, "L'arrière-plan migratoire de la population du Grand-Duché de Luxembourg: structure et implications démographiques".

Table 3: Level of education by nationality in 2011 and 2021 (Luxembourg nationals and foreigners)

Level of education	2011		2021		Difference (in % points)	
	Luxembourgier	Foreigners	Luxembourgier	Foreigners	Luxembourgier	Foreigners
Lower secondary and below	32.4%	40.2%	22.4%	30.4%	-10.0	-9.8
Upper secondary	43.2%	27.0%	45.3%	25.5%	2.1	-1.5
Bachelor, tertiary and superior	13.4%	11.4%	17.0%	15.8%	3.6	4.4
Master and above	11.0%	21.5%	15.3%	28.3%	4.2	6.8
Total	100.0%	100.0%	100.0%	100.0%		

Source: STATEC, RP2011, RP2021

Note: this table refers to people aged 15 and over who have completed their studies and have indicated their level of education.

Foreign nationals are a very heterogeneous group, particularly in terms of their cultural origins. This is why it is interesting to break down the population not by nationality, but by place of birth. Table 4a thus compares, among residents born in Luxembourg, the levels of education according to the mother's country of birth (information more frequently present than that concerning the father). At the same time, table 4b, which concerns people born abroad, allows us to measure differences in levels according to the respondent's place of birth. Together, these data allow us to compare the first and second generations of immigrants with the native-born.

Table 4a: Level of education of residents born in Luxembourg by mother's country of birth in 2011 and 2021 (for the 10 main countries, % in rows)

Mother's country of birth	2011				2021			
	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above
Germany	38.3%	42.6%	11.7%	7.5%	30.7%	45.0%	14.0%	10.2%
Belgium	25.4%	42.9%	17.0%	14.6%	19.0%	43.4%	19.4%	18.2%
Cape Verde	30.9%	55.7%	9.7%	3.7%	19.0%	64.8%	11.5%	4.7%
Spain	18.0%	62.1%	10.7%	9.1%	14.1%	56.7%	13.5%	15.7%
France	30.5%	43.6%	14.0%	11.9%	22.3%	45.8%	17.0%	14.8%
Italy	31.3%	48.2%	12.3%	8.1%	23.4%	52.4%	14.4%	9.8%
Luxembourg	32.5%	43.4%	13.4%	10.7%	23.6%	46.1%	16.6%	13.6%
Netherlands	14.8%	53.0%	18.3%	13.8%	12.0%	52.9%	18.7%	16.4%
Poland	39.5%	40.1%	13.6%	6.8%	30.6%	43.2%	15.4%	10.9%
Portugal	26.0%	55.6%	11.5%	6.9%	15.3%	59.3%	17.1%	8.3%
United Kingdom	11.2%	33.5%	18.0%	37.3%	3.9%	29.7%	31.7%	34.6%
Others countries	38.1%	39.8%	11.8%	10.3%	15.8%	48.9%	17.9%	17.4%
Overall	32.3%	44.0%	13.3%	10.5%	22.8%	47.4%	16.6%	13.2%

Source: STATEC, RP2011, RP2021

Note: this table concerns people aged 15 and over, born in Luxembourg, who have completed their studies and have indicated their level of education.

Note for the reader: in 2011, among respondents born in Luxembourg and whose mother was born in Luxembourg, 10.7% had a Master's degree or higher. This rate rises to 13.6% in the 2021 census.

Table 4b: Level of education of foreign-born residents by country of birth in 2011 and 2021 (for the 10 main countries, % in rows)

Respondent's country of birth	2011				2021			
	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above
Germany	21.2%	36.1%	14.3%	28.4%	13.1%	35.7%	17.4%	33.8%
Belgium	13.8%	26.6%	26.1%	33.5%	9.6%	25.7%	27.1%	37.5%
Cape Verde	75.2%	22.1%	2.0%	0.7%	58.4%	34.1%	5.4%	2.1%
Spain	25.5%	17.9%	10.1%	46.4%	14.0%	12.7%	21.1%	52.1%
France	15.6%	32.1%	18.1%	34.2%	8.9%	25.7%	19.8%	45.6%
Italy	47.9%	25.0%	6.9%	20.3%	30.9%	25.4%	11.3%	32.3%
Netherlands	18.3%	34.2%	19.0%	28.5%	14.5%	35.5%	22.6%	27.4%
Poland	14.8%	27.0%	11.2%	47.1%	7.0%	24.1%	13.2%	55.7%
Portugal	73.9%	21.7%	2.5%	1.9%	65.2%	26.6%	4.8%	3.4%
United Kingdom	3.5%	24.2%	33.3%	39.0%	2.6%	23.8%	39.9%	33.6%
Others countries	22.2%	30.8%	14.9%	32.0%	16.8%	27.7%	21.6%	33.9%
Overall	39.8%	27.1%	11.7%	21.4%	28.6%	27.2%	16.4%	27.8%

Source: STATEC, RP2011, RP2021

Note: this table concerns people aged 15 and over, born abroad, who have completed their studies and have indicated their level of education.

Note for the reader: in 2011, 28.4% of respondents born in Germany had a Master's degree or higher. This rate rises to 33.8% in the 2021 census.

This comparison shows the equalising effect of birth in Luxembourg: the differences are much smaller in table 4a than in table 4b, confirming that immigrants are more unequal than people born in Luxembourg. Among the latter, there are certainly substantial inequalities, of the order of several percentage points: compared with residents born in Luxembourg to a mother born in Luxembourg, for whom the proportion of holders of a Master's degree or higher is 13.6% in 2021, for children of an immigrant mother born in Portugal or Cape Verde this proportion is 8.3 and 4.7% respectively. Conversely, when the mother was born in the United Kingdom, the rate of obtaining a Master's degree or higher is 34.6%.

Among residents born abroad (first-generation immigrants), the contrasts are much greater. For immigrants originating from an OECD member country³, the rates of obtaining a Master's degree or higher are significantly higher than those of Luxembourg-born residents: for example, 45.6% for immigrants born in France, 52.1% for those originating from Spain, 55.7% for those born in Poland. On the other hand, some countries of origin have significantly lower levels of education: resident immigrants from Cape Verde (2.1% with a Master's degree or higher and 5.4% with a Bachelor's degree or higher) and Portugal

(3.4% with a Master's degree or higher) have the lowest overall levels of education.

This comparison according to place of birth shows that being born in Luxembourg relatively homogenises the rates of acquisition of a higher education qualification, even if significant differences remain according to origin. Conversely, the qualification profiles of migrants from different countries of origin are highly specialised: Portugal and Cape Verde remain countries providing a low-skilled workforce, while others (Spain, France, Poland, etc.) offer highly qualified expatriates.

The variations between 2011 and 2021 reflect the stability of the structures, but also the often growing gaps in access to Master's degrees and above: the gaps have widened between native Luxembourgers (who have progressed by 3 points, from 10.7 to 13.6% obtaining Master's degrees and above) and immigrants of Portuguese or Cape Verdean mother, who have progressed by only one or two points. Symmetrically, countries of origin with more highly-qualified migrants saw their rate of obtaining a Master's degree and above rise faster than that of native-born people. The picture is more complex and therefore more nuanced at Bachelor's level and above.

³ Organisation for Economic Cooperation and Development

There are considerable, and often growing, differences between people born in Luxembourg to Luxembourg-born mothers and most migrants from the richest OECD countries, where the proportion of people with a Master's degree or higher is three to four times higher. To put it another way, at Master's level and above, Luxembourg becomes heavily dependent on skilled immigration. As a result, people born in Luxembourg will become a minority among graduates of long-term higher education, with their share among holders of a Master's degree or higher falling from 38.3% to 31.1% between 2011 and 2021 (Table 5).

Table 5: Percentage of people born in Luxembourg for each level of education in 2011 and 2021

Level of education	2011	2021	Difference (in % points)	% relative change
Lower secondary and below	50.7%	43.0%	-7.6	-15%
Upper secondary	67.3%	62.3%	-4.9	-7%
Bachelor, tertiary and superior	59.0%	49.0%	-9.9	-17%
Master and above	38.3%	31.1%	-7.1	-19%
Total	55.9%	48.7%	-7.2	-13%

Source : STATEC, RP2011, RP2021

Note: this table concerns people aged 15 and over who have completed their studies and have indicated their level of education.

Note for the reader: in 2021, of those with a Master's degree or higher, 31.1% were born in Luxembourg and 68.9% were born abroad.

This points to the need to extend policies that can promote the access of people born in Luxembourg to higher education qualifications, both through initial training and by promoting the return of adults to study.

2.3 Level of education and professional activity: qualifications remain an advantage

The rapid rise in the population's level of education can give rise to a degree of 'diploma inflation' when the economy is not growing fast enough, with increasing numbers of young graduates having to accept more menial jobs. This phenomenon, which characterises many southern European countries in particular, will not be seen in Luxembourg between 2011 and 2021. This is because the Luxembourg job market remains dynamic and continues to demand highly qualified employees.

In fact, the various occupations classified according to the International Standard Classification of Occupations (ISCO) code have maintained similar degree structures over the 2011-2021 intercensal period, with a general progression towards holders of Bachelor's degrees and above and Master's degrees and above. The most rapid change has been in the "Administrative type employees" category, where

the proportion of holders of Bachelor's degrees and above has doubled, and that of Master's degrees and above has more than tripled⁴ (Table 6). The need for new qualifications linked to the digitisation of the economy and internationalisation has led to a rapid transformation of this occupational group. Conversely, the "Intellectual and scientific professions" have seen a slight increase in the proportion of baccalaureate holders, corresponding to insecure jobs.

The rapid increase in the number of people in employment, particularly in sectors requiring higher qualifications, has made it possible to absorb the rise in the proportion of graduates in the resident population without causing degree inflation.

⁴ As a reminder, these census figures relate exclusively to the resident population and therefore do not include cross-border commuters.

Table 6: Level of education by occupation (ISCO) in 2011 and 2021 (% in rows)

Profession	2011				2021			
	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above
Managers	7.3%	24.0%	19.9%	48.7%	6.3%	21.6%	21.5%	50.6%
Professionals	0.8%	9.6%	27.0%	62.6%	2.1%	14.8%	26.0%	57.1%
Technicians and associate professionals	8.3%	56.4%	24.4%	10.9%	7.9%	52.9%	26.6%	12.5%
Clerical support workers	16.1%	72.1%	7.8%	4.0%	11.9%	57.3%	15.9%	14.9%
Service and sales workers	29.0%	62.9%	6.5%	1.6%	22.7%	64.8%	9.2%	3.2%
Skilled agricultural, forestry, and fishery workers	30.4%	63.5%	5.0%	1.2%	25.8%	64.5%	6.9%	2.8%
Craft and related trades workers	56.0%	35.0%	8.6%	0.4%	39.5%	48.6%	10.7%	1.2%
Plant and machine operators, and assemblers	60.3%	35.8%	3.3%	0.6%	44.5%	48.6%	5.4%	1.4%
Elementary occupations	78.5%	19.6%	1.4%	0.4%	56.8%	36.3%	5.4%	1.6%
Armed forces occupations	37.7%	53.8%	2.3%	6.3%	23.6%	49.0%	17.6%	9.9%

Source: STATEC, RP2011, RP2021

Note: this table concerns people aged 15 and over who have completed their studies and have indicated their level of education. The International Standard Classification of Occupations (ISCO) is drawn up by the ILO (International Labour Organisation). The most recent version is used in this publication.

Note for the reader: in 2011, among respondents, 48.7% of directors and senior managers had a Master's degree or higher. This rate is 50.6% in 2021.

2.4 Level of education and sector of activity

At the same time as the structure of occupations is changing, the sectors of activity (defined by NACE⁵) of residents in employment reflect the changes in residents' qualifications. Table 7 highlights a general need for diversity, to varying degrees, in the skill levels of employees in each of these sectors: construction needs blue-collar workers and engineers, public administration needs typists and managers. Other sectors, such as healthcare, need a greater diversity of training levels, but they too are experiencing an increase in the skill levels of their employees.

Some sectors, such as Luxembourg's financial centre, require an increasingly highly qualified workforce. While a third of jobs in the 'Financial and insurance activities' sector were filled by holders of a Master's degree or higher in 2011, half of its employees have this level of qualification by 2021. This is a considerable change. The "Information and communication" sector and the "Professional, scientific and technical activities and administrative and support service activities" sector, where most of the expertise service companies are located, are also concerned.

⁵ NACE stands for Nomenclature statistique des Activités économiques, a system for classifying economic activities. The most recent version is used in this publication.

Table 7: Level of education by sector of economic activity in 2011 and 2021 (% online)

Economic sector	2011				2021			
	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above	Lower secondary and below	Upper secondary	Bachelor, tertiary and superior	Master and above
Agriculture, forestry and fishing	30.6%	62.0%	4.8%	2.6%	20.8%	66.2%	8.8%	4.2%
Manufacturing, mining and quarrying, and other industry	34.1%	41.4%	11.7%	12.8%	24.5%	45.0%	14.5%	16.0%
Construction	61.9%	27.8%	7.6%	2.7%	49.3%	37.9%	8.7%	4.0%
Wholesale and retail trade, transportation and storage, accommodation and food service activities	33.8%	50.9%	9.2%	6.1%	26.2%	53.4%	12.1%	8.4%
Information and communication	15.5%	42.2%	17.1%	25.2%	6.0%	29.0%	25.1%	40.0%
Financial and insurance activities	6.2%	40.6%	18.7%	34.5%	1.8%	24.6%	23.6%	50.0%
Real estate activities	26.7%	43.8%	17.6%	11.9%	16.9%	45.1%	19.2%	18.9%
Professional, scientific, technical, administrative and support service activities	28.0%	28.6%	11.0%	32.4%	13.9%	23.1%	17.3%	45.6%
Public administration	19.0%	41.4%	19.8%	19.8%	12.4%	41.5%	23.1%	23.1%
Other services	11.9%	26.2%	16.4%	45.5%	14.6%	22.3%	17.2%	45.9%

Source: STATEC, RP2011, RP2021

Note: this table refers to people aged 15 and over who have completed their studies and have indicated their level of education.

2.5 Generational growth in access to Master's degrees and above remains slower among people born in Luxembourg

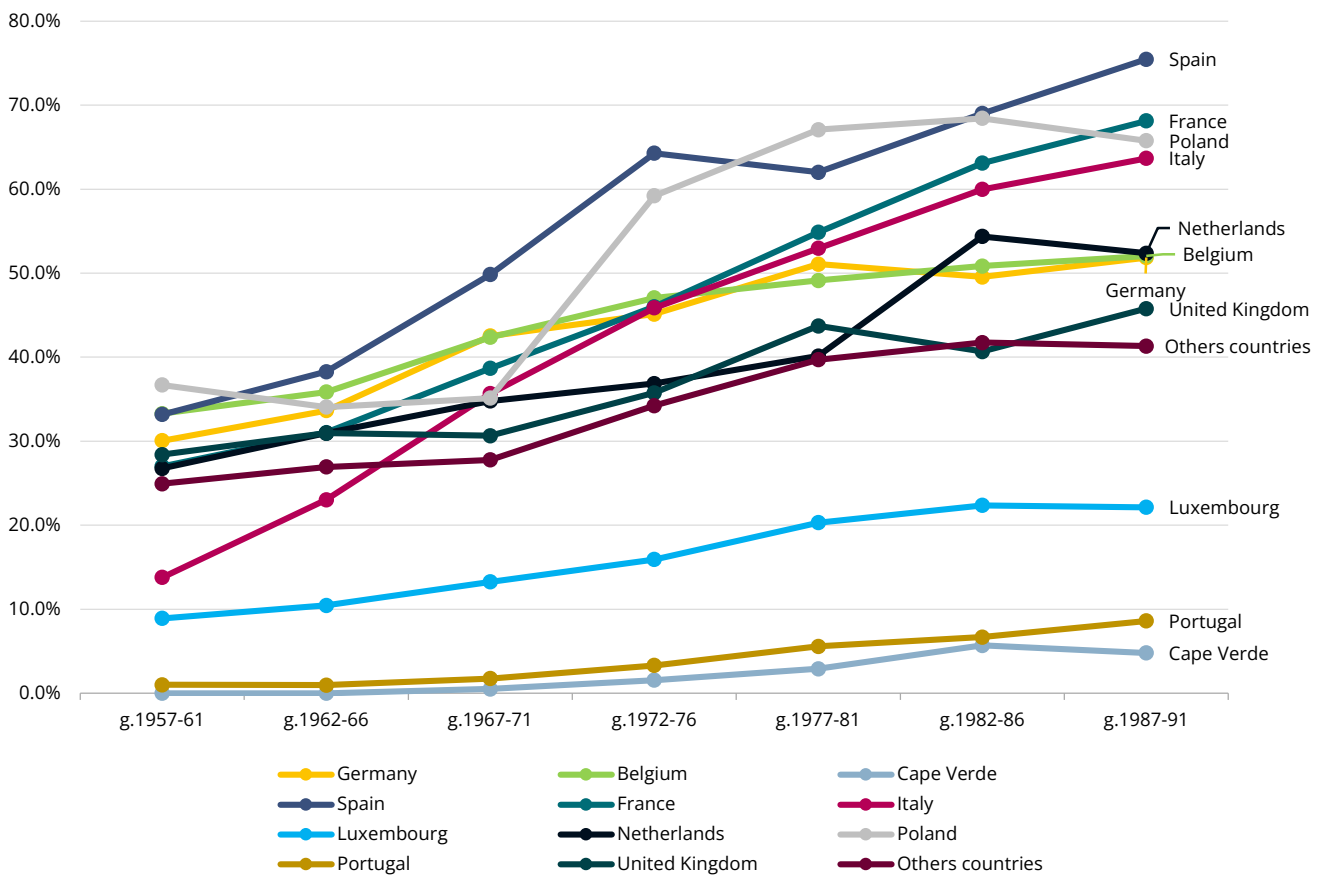
The growth in the proportion of graduates in a population is also due to a generational replacement effect: older generations tend to have fewer qualifications and are gradually being replaced by younger generations with a greater chance of completing longer studies thanks to a more mature university system. This is a worldwide phenomenon, with exceptions only in critical historical situations (major economic crisis, revolution, war, etc.).

In this context, it is important to compare education levels between different origins and generations (age groups). For example, if we see that people born in Luxembourg are less likely to have a Master's degree or higher than people born in Belgium (Table 1), this difference could be due above all to the fact that people born in Luxembourg are older and more likely to have

only a Bachelor's degree or higher, whereas people born in Belgium are more likely to be young immigrants coming to work in Luxembourg, and therefore more likely to have a Master's degree or higher.

In relation to these hypotheses, the empirical findings confirm the existence of a major challenge for Luxembourg: when it comes to obtaining a Master's degree and above, a level of qualification that is clearly increasingly sought after in a large number of sectors, people born in Luxembourg are experiencing a structural lag that is hardly being reduced, since despite the expansion of higher education among people born in Luxembourg, these gaps are being maintained or increased within the new generations. This can be seen in Figure 5, which details the percentage of holders of a Master's degree or higher, by country of birth and generation of birth, for people aged 30 or over - a threshold below which the rates of obtaining long higher education qualifications have not stabilised. We therefore provide details by generational group, from the generation born between 1987 and 1991, who will be around thirty years old in 2021, to those aged just over 60, born between 1957 and 1961.

Figure 5: Obtaining a Master's degree or higher by generational group and country of birth (main countries of birth) in 2021



Source: STATEC, RP2021

Note: this table concerns residents aged 30 and over, born in Luxembourg, having completed their studies, and having answered the questions on level of education and country of birth. The ten main countries of immigration plus Luxembourg are shown here.

Figure 5 confirms that older generations generally have fewer Master's degrees and above than more recent generations, even if this progression is not perfectly linear, as is the case for immigrants from Poland or the Netherlands. Other countries of origin show systematic and substantial increases (Spain and Italy, in particular). If the person was born in Luxembourg, the number of people with a Master's degree or higher rose from 15.2% to 22.8% between the generation born around 1970 and that of 1990. This is relatively rapid, but it should be noted that this increase is not linear, since the percentage has stagnated for the latest generations. A comparison with other countries of origin shows that while Luxembourg-born people are structurally more likely to hold a Master's degree and more than people born in Portugal or Cape Verde - countries that provide Luxembourg with the bulk of its less-skilled migrants - the percentages remain well below those of the main countries supplying highly-skilled migrants. As a result, Luxembourg is still struggling to retain and qualify its native population at Master's level and above, which is increasingly the qualification required in the country's most active economic sectors.

This lag in terms of access to the highest qualifications (Masters and above) observed for the average of people born in Luxembourg, and the slow progress observed for recent generations (today's thirty-something), mean that Luxembourg's economic fabric is heavily dependent on the migration of highly qualified workers. To offset this imbalance, we need to promote access to long studies and better prepare the generations currently in secondary education in Luxembourg. Another solution to be considered is continuing education, in particular university education leading to a lifelong qualification, and the validation of acquired experience (VAE). These policies already exist, but they clearly need to be stepped up, given that the gaps between the typical residents of the 'golden migration' (Fehlen et al., 2009) and the native-born are considerable and show little sign of narrowing. Even if other policies are conceivable or already exist (maintaining a reserved employment sector, promoting the local language, etc.), the high demand for qualifications by companies and the relative weakness of native-born qualifications are producing imbalances that could become even greater.

There is considerable room for development in terms of promoting higher education graduates among the native population, as current provision is clearly far from saturation point. This presupposes the development of more extensive school and university policies.

2.6 More than a third of higher education graduates born in Luxembourg acquired their highest qualification in Luxembourg

Excluding non-responses⁶, 94.6% of people who had completed their secondary education or earlier had completed their studies in Luxembourg, compared with 2.9% in Belgium, 0.9% in France and 0.8% in Germany. In other words, the secondary education of native residents took place almost entirely in Luxembourg.

For higher education as a whole, the relative share of studies in Luxembourg remains the majority: 37.4% of Luxembourg-born higher education graduates acquired their highest diploma in Luxembourg, this percentage being driven upwards by Bachelor's and short higher diplomas, the majority of which were validated in Luxembourg⁷ (61%) (Table 8). However, in 62.6% of cases, the higher education studies of Luxembourg-born residents took place outside the country, particularly for holders of a Master's degree or higher (91%).

These results relate to the entire population aged 25 or over born in Luxembourg, and therefore combine extremely different situations depending on the generation, which has experienced very different contexts for obtaining qualifications. This is why it is relevant to consider different generations here too: the '1992-96 generation' groups together people aged 25 to 29 in 2021 (i.e. born between 1992 and 1996), the '1967-71 generation' (aged 'around 55' in 2021) and so on. This comparison also makes it possible to understand the transformations in the countries of study chosen (Table 9).

Table 8: Country of completion of studies for people born in Luxembourg with a higher education qualification according to the 2021 census

Country of completion of studies	Bachelor, tertiary and superior	Master and above	Higher education
Germany	8.1%	24.3%	15.4%
Austria	1.0%	4.3%	2.5%
Belgium	20.4%	19.8%	20.1%
France	4.9%	28.4%	15.6%
Luxembourg	61.0%	9.0%	37.4%
United Kingdom	1.7%	5.8%	3.6%
Switzerland	1.1%	3.9%	2.4%
Other countries	1.8%	4.5%	3.1%
Total	100.0%	100.0%	100.0%

Source: STATEC, RP2021

Note: this table concerns residents aged 25 and over, born in Luxembourg, who have completed their studies, and who have obtained a Bachelor's degree and above or a Master's degree and above. The main countries where studies were validated are detailed here.

⁶ In 2021, among all Luxembourg-born residents aged 25 and over who have completed their studies, non-responses to the country of completion of the highest level of diploma obtained represents 10.3% of the population, and this rate falls to 3.3% for holders of a higher education diploma.

⁷ It should be noted that the more people born in Luxembourg gain access to a Master's degree after a Bachelor's degree in Luxembourg, the less the specific contribution of studies validated in Luxembourg will be visible, since only the last diploma is considered for the country in which the studies were completed.

Table 9a: Country of completion of studies for people born in Luxembourg with a Bachelor's degree and higher, by generation in 2021 (year of birth)

Country of completion of studies	g.1957-61	g.1962-66	g.1967-71	g.1972-76	g.1977-81	g.1982-86	g.1987-91	g.1992-96
Germany	3.9%	3.5%	4.1%	3.8%	5.8%	8.6%	15.0%	18.7%
Austria	0.9%	0.7%	0.4%	0.5%	0.5%	1.4%	2.1%	1.8%
Belgium	14.3%	15.6%	18.2%	27.7%	24.0%	28.2%	26.3%	26.0%
France	5.1%	4.2%	4.6%	4.6%	5.3%	4.3%	3.8%	3.7%
Luxembourg	72.8%	72.4%	69.2%	60.0%	58.8%	51.6%	47.0%	43.4%
United Kingdom	0.7%	1.1%	1.4%	1.4%	2.7%	2.4%	2.2%	2.1%
Switzerland	1.5%	1.1%	0.9%	0.6%	0.6%	0.3%	1.2%	1.2%
Other countries	0.8%	1.3%	1.4%	1.4%	2.4%	3.1%	2.3%	3.1%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 9b: Country of completion of studies for people born in Luxembourg with a Master's degree or higher, by generation in 2021 (year of birth)

Country of completion of studies	g.1957-61	g.1962-66	g.1967-71	g.1972-76	g.1977-81	g.1982-86	g.1987-91
Germany	19.4%	22.5%	20.7%	19.7%	25.0%	30.0%	29.2%
Austria	7.1%	4.2%	2.8%	3.5%	3.1%	4.4%	5.9%
Belgium	24.5%	24.2%	29.8%	25.5%	16.7%	13.5%	15.2%
France	37.2%	35.4%	29.9%	32.2%	34.4%	26.5%	18.1%
Luxembourg	2.9%	3.8%	5.5%	6.1%	6.4%	10.2%	13.0%
United Kingdom	2.2%	3.6%	4.2%	5.8%	8.0%	7.5%	9.0%
Switzerland	4.8%	3.2%	4.4%	3.0%	2.8%	3.5%	3.3%
Other countries	1.9%	3.0%	2.8%	4.1%	3.7%	4.3%	6.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Source: STATEC, RP2021

Note: this table concerns residents aged 25 and over, born in Luxembourg, who have completed their studies, and who have obtained a Bachelor's degree and above or a Master's degree and above. The main countries in which studies are validated are shown here.

An analysis by generation of the evolution of qualifications according to the country in which the studies were completed confirms the fact that short higher education (Bachelor's and short higher education) and long higher education (Master's and above) obey different logics. Traditionally, a large proportion of short tertiary education consisted of higher technician diplomas or non-university certificates, and as a result, in the 1962-66 generation, 72.4% of these diplomas were validated in Luxembourg, with the remainder choosing, more often than not, Belgium and, secondarily, France or Germany as their country of study. From generation to generation, at Bachelor's level and higher, there was a diversification and strong expansion of Belgium and Germany, and a fall in Luxembourg's relative share from 72.8% to 43.4% of the total (Table 9a).

At Master's level, the situation is completely different. In the past, the 1962-66 generation mainly went to France (35.4%), Belgium (24.2%) and Germany (22.5%). Luxembourg accounted for only 3.8% of Master's-level studies. Since then, the higher education landscape has changed radically, notably with the creation of the University of Luxembourg. There has been a strong diversification, with a substantial fall in the shares of France and Belgium in Master's level and above education for young residents, an expansion of Germany (for 29.2% of the latest generation) and a rise in the power of Luxembourg, which has gone from 3.8% to 13.0% in less than 25 years. This market share may seem modest, but it makes a significant contribution to the rise in the level of education of new generations of Luxembourg natives.



These data for Luxembourg natives show a certain divergence from that for skilled immigrants (see Table 10a and b in the appendices), for whom the places where they obtained their qualifications (Bachelor's degree and above versus Master's degree and above) are extremely diverse, and increasingly so. At Bachelor's level and above, obtaining a degree in France remains substantial for immigrants (11.7%), but has lost more than half its market share to Belgium, which has now been overtaken by Luxembourg, which is playing its part in making the country more attractive. Above all, the growing share of "other countries" underlines the high level of diversity.

These trends in skilled migrants are even clearer at Master's level, where France has gained market share, while neighbouring European countries have lost ground to Luxembourg, whose Master's degrees account for 7.3% of the market, compared with 2.5% 25 years earlier. Once again, the 'other country' aggregate has a predominant share and highlights a diversification in the places where immigrants graduate.



3.

Residential location and education levels

While analysing the level of education and its evolution is essential for evaluating and implementing education policies, the geographical location of individuals according to their level of education is not random and often reveals constraints and trends at work in the residential market. The level of education is often correlated with other socio-economic variables, and in particular, in Luxembourg, with immigration, as we have seen above. The relative concentration or dispersion of individuals according to their level of education can thus reveal difficulties in accessing housing or spatial segregation processes which, in turn, can have consequences for employment or education through group effects or difficulties in access.

We therefore analyse here the geographical structure of education levels both at municipal level and at the level of the 1 km cells made available for the first time in this census.

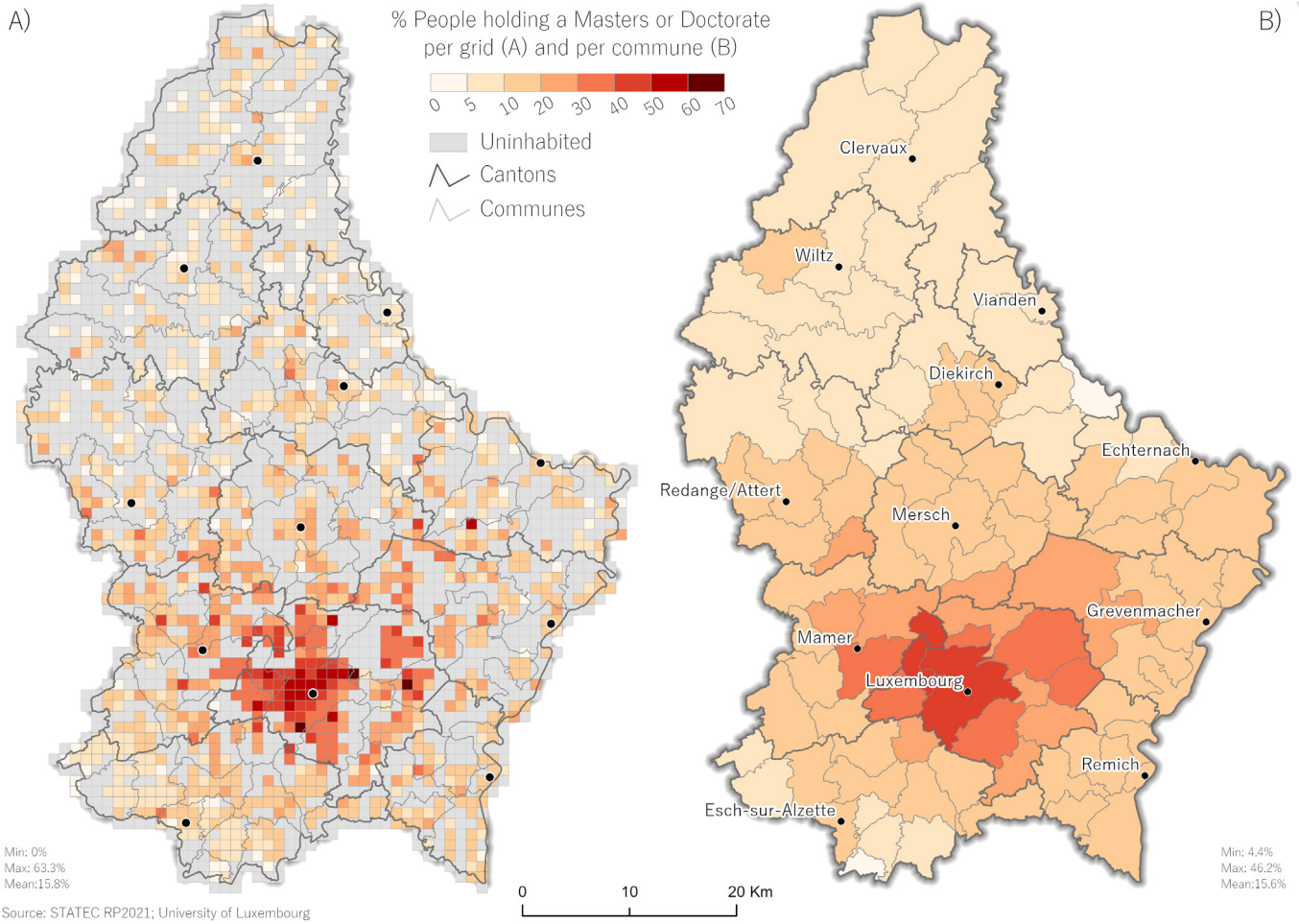
This analysis requires some prior knowledge of the spatial structure of the entire population studied. This is given in the appendices for comparison. While the geography of the population aged over 15 who are no longer in education is relatively uncontrasted (with the exception of an ageing effect in rural areas and the presence of many working people without children in the capital), excluding the population who did not indicate their level of education reduces the expected shares in urban centres and tends to smooth the map of the population studied (see appendices).

3.1

Very high concentration of the most highly educated

It is essentially the effect of centrality - distance from Luxembourg City - on the most highly educated people that is the striking geographical structure. Maps 1 A and B show the percentage of people with a Master's or Doctorate degree in each 1 km² residential cell and by municipality of residence. Unlike an analysis on a communal scale, the use of the 1 km grid enables us to carry out a fairly detailed analysis of centrality, demonstrating an extremely clear effect of distance from Luxembourg City. There are, of course, some high values for graduates at large distances, but these are often linked to low population volumes or small town centres. We also note a one-off 'Belval' effect, which is all the more visible as the southern region has low levels of highly qualified people (Map 4).

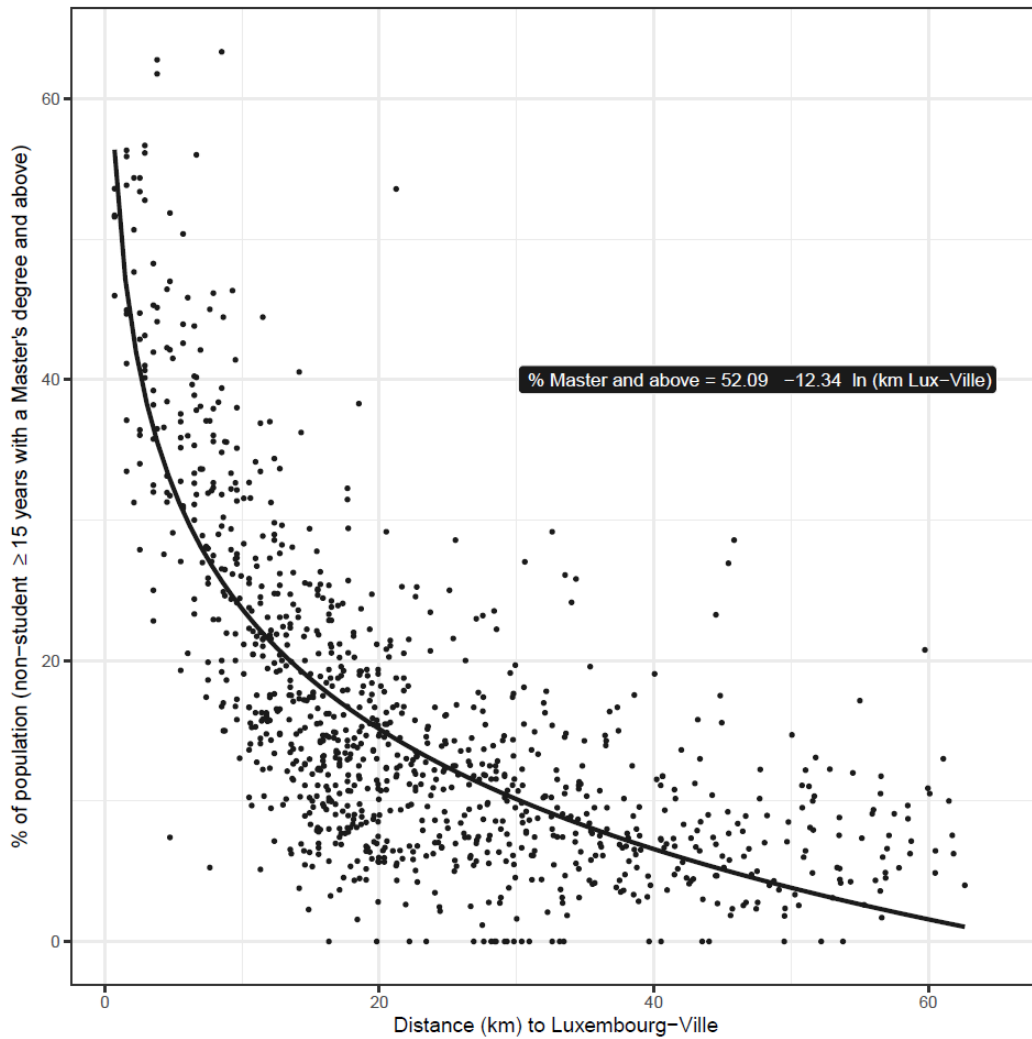
Maps 1: Percentage of residents with a Master's degree or above, by 1 km cell and by municipality in 2021



Note: Percentage of the population with a Master's or Doctorate degree among the non-student resident population aged over 15 who provided a level of education. A (left): by 1 km cell (cells with a population (non-students aged over 15) of less than 10 are shown in white). B (right) by commune.

Even more clearly than map 1, figure 6 shows how this percentage of highly qualified people decreases with distance from Luxembourg City (distance as the crow flies to the Town Hall). The pattern of decrease with distance is clear, and distance alone explains 60% of the variation in the share of highly qualified people in each 1 km cell. The effect is not linear: the highly qualified population represents 52% of the population in the centre, in Luxembourg City, but falls to 32% at 5 km, 15% at 20 km and 8% at 35 km.

Figure 6: Percentage of the population with a Master's degree or higher according to distance from Luxembourg City per 1 km cell in 2021



Source: STATEC, RP2021

Note for the reader: each point indicates the percentage of the population with a Master's degree and above among people aged 15 and over who have completed their studies, according to the distance between the place of residence and Luxembourg City (town hall).

Points: observations per 1km cell with a number of individuals greater than or equal to 20. Curve: estimated semi-logarithmic model, the proportion of individuals with a Master's degree or more per cell decreases according to the formula: $52.09 - (12.34 \times \ln(\text{distance to Lux-Ville}))$.

Classical urban theory teaches us that, apart from amenity effects (search for a green living environment, shops or cultural services) or direct cumulative and segregative effects (location of households near households that are similar to them), the location of households as a function of distance from the centre is mainly governed by the ratio between the value of transport time (t) and the preference for a larger dwelling area (q). The central or peripheral location of the wealthiest or poorest households then depends on how this ratio t/q varies with income (Brueckner, Zénou and Thisse, 1999). If t/q increases with income, the richest households are located in the centre and the poorest on the outskirts of cities. LeRoy and Sonstelie (1983) have also suggested that if rich and poor households share the same mode of transport, t/q does increase with income. Considering that the level of education is a good reflection of income, this

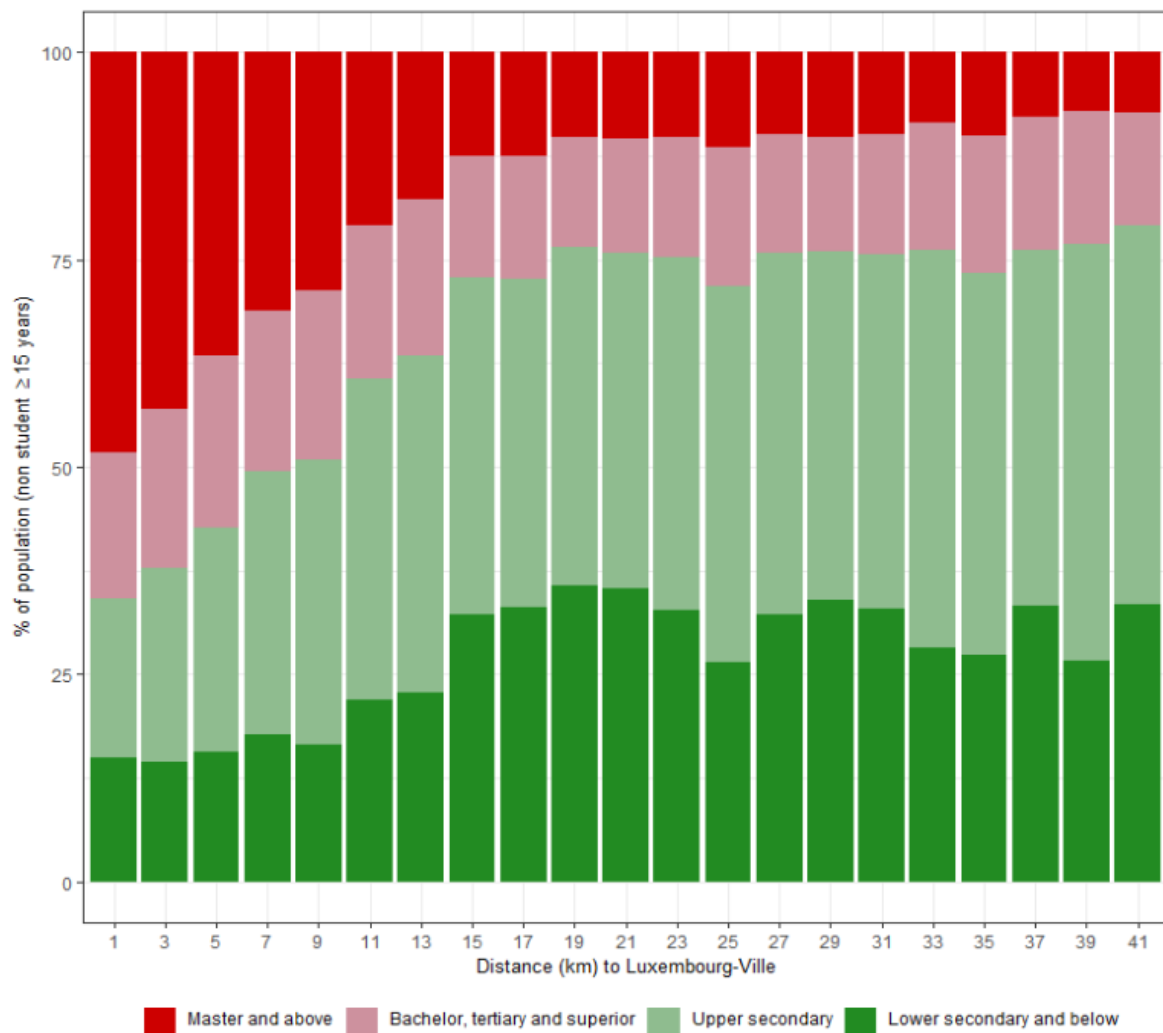
is quite clearly the case in Luxembourg, with a value of time considered more important by the most educated households and a shared mode of transport (car, tram), and therefore a central location in the capital. We should probably also add the effects of Luxembourg City's pleasant surroundings and cultural amenities, which are more attractive to households with a higher level of education and the ability to pay this additional premium on the property market. Also, given that a large number of holders of Master's degrees and above are immigrants who have arrived in Luxembourg recently (in the last 5 years), we can assume that this reinforces the attraction exerted by the capital on newcomers who will prefer it to a more peripheral location in order to be close to their community of origin.

To complete and verify the analysis, it is interesting to look at the spatial distribution of the other groups. Figure 7 shows the separate and cumulative shares of each education group for regular intervals of distance from the centre of the capital. The share of the most highly educated declines with distance. Conversely, the proportion of people with a higher secondary education increases with distance (although following a less clear pattern: 18% of residents in the centre of Luxembourg City have a higher secondary education qualification, compared with 47% 35 km away). Finally, the least qualified and especially holders of a Bachelor's degree and short higher education are located fairly evenly across the Grand Duchy.

The maps equivalent to the 1 per cell maps for each of the other groups are shown in Appendix 2.

Given the high degree of job centralisation in the capital⁸, we can see that the two least-qualified groups are potentially less accessible to jobs. This deficit can have consequences in terms of reduced job opportunities, but also in terms of daily organisation linked to distance (lost time) or the financial cost of transport (recourse to or dependence on the car). This simplified fact needs to be clarified by more complex modelling that takes into account multiple individual characteristics in addition to distance, including gender, age, sector of employment and country of birth.

Figure 7 : Percentage of the population by level of education and distance to Luxembourg City by 1 km cell in 2021



Source: STATEC, RP2021

Note: Percentage of the population with a Master's or Doctorate degree among the non-student resident population aged over 15 who provided a level of education, whether born in Luxembourg (blue) or abroad (red), as a function of the Euclidean distance to Luxembourg City. Points: observations per 1km cell with a count greater than or equal to 20. Curve: estimated semi-logarithmic model.

⁸ See "Une polarisation croissante des déplacements domicile-commuter au Luxembourg", 2024, Premiers Résultats, no. 10.

3.2 Education and residential location by country of birth

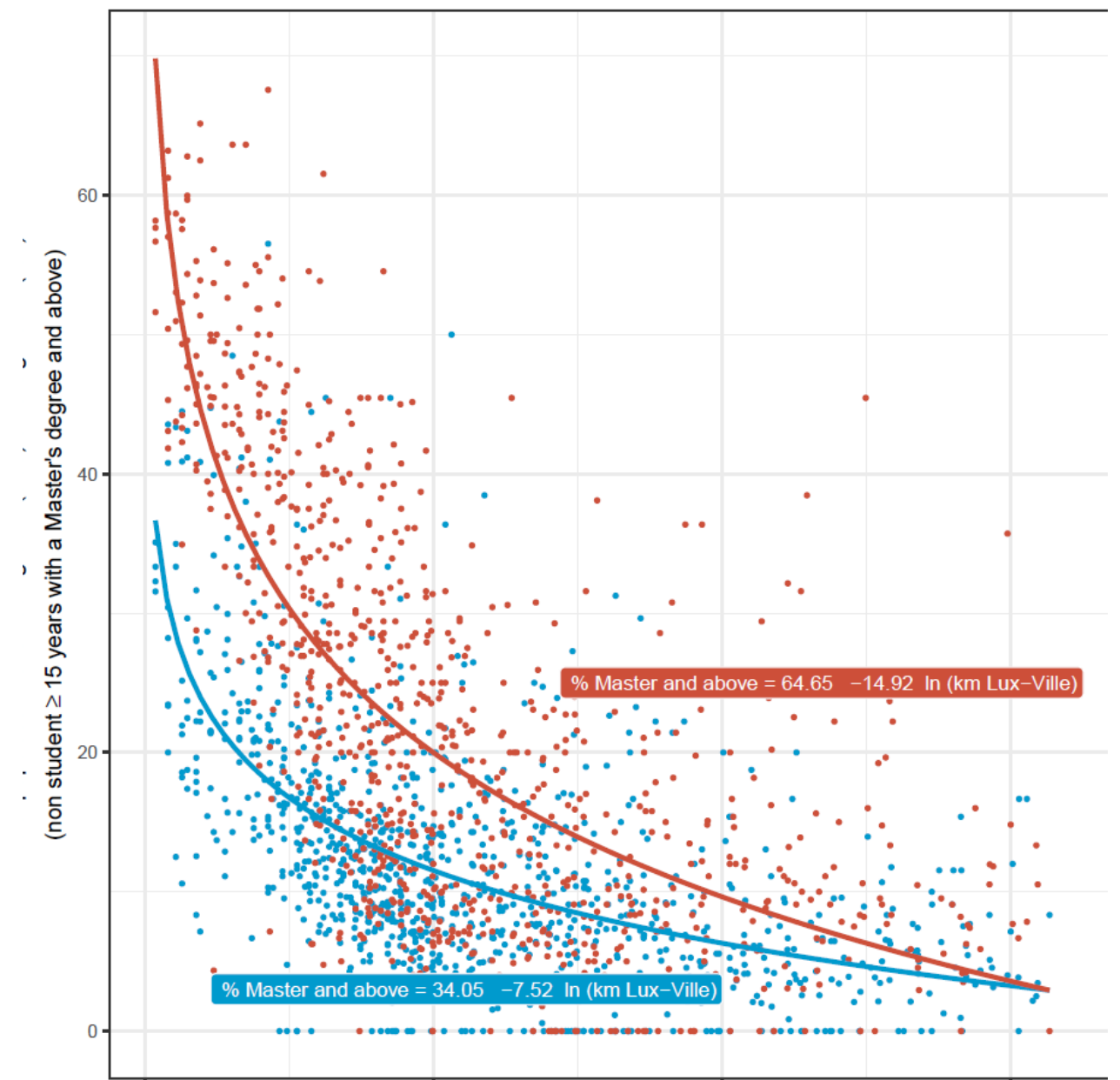
As a first approximation, we look at whether the differentials in distance to the centre are the same when we consider whether or not one was born in Luxembourg. Indeed, we have shown in the first two parts that place of birth is an important dimension in understanding education levels. In Figure 8, we therefore repeat the graph in Figure 5 showing the decrease in the proportion of people with a Master's degree or higher as a function of distance from the centre (in Luxembourg City). This time we distinguish between the population born in Luxembourg (in blue) and that born abroad (in red). As expected, and as indicated at the beginning of the publication, we see here that the percentage of people born in Luxembourg with a Master's degree or higher is lower than for immigrants, whatever the distance to the capital. However, as in the general case, we still find a decreasing curve. Nevertheless, the decrease in the proportion of highly qualified residents as a function of distance from Luxembourg City is twice as small for native Luxembourgers compared with immigrants (coefficient of the log of distance equal to approximately -7.5 for Luxembourgers compared with -15 for foreigners), but remains clear and significant. The 'income' effect on residential location is therefore present for people born in Luxembourg as well as for immigrants, whereas we might have expected greater homogeneity across the territory for highly educated natives (given that they are largely under-represented in the capital⁹).

To sum up, while there are indeed different levels of education between countries of birth and therefore directly a geographical differential between the relative share of Luxembourg-born and foreign-born people in each location as a function of distance from Luxembourg City, we cannot conclude that the value of travel time or residential preferences are fundamentally different between these groups. The differences in location shown on map 1 between levels of education are a priori more an effect of income and therefore of the ability of people with the highest level of education to take up better-paid jobs and to bid for the locations closest to jobs and urban amenities. Thus, being born in Luxembourg will have the effect of limiting the distance to the capital, even with a drop in the level of education.

⁹ See RP2021 Premiers Résultats, n°9, "Répartition géographique des immigrés au Luxembourg. Dynamics and spatial segregation with natives".



Figure 8: Percentage of the population with a Master's degree or higher according to distance from Luxembourg City and country of birth (Luxembourg or foreign) per 1 km cell in 2021



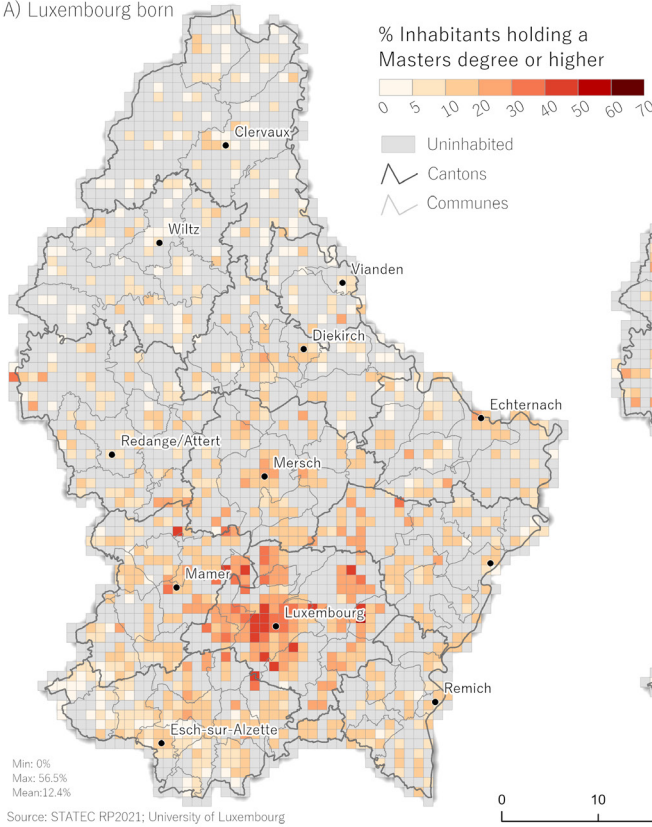
Source : STATEC, RP2021

Note: Percentage of the population with a Master's or Doctorate degree among the non-student resident population aged over 15 who provided a level of education, whether born in Luxembourg (blue) or abroad (red), as a function of the Euclidean distance to Luxembourg City. Points: observations per 1km cell with a count greater than or equal to 20. Curve: estimated semi-logarithmic model.

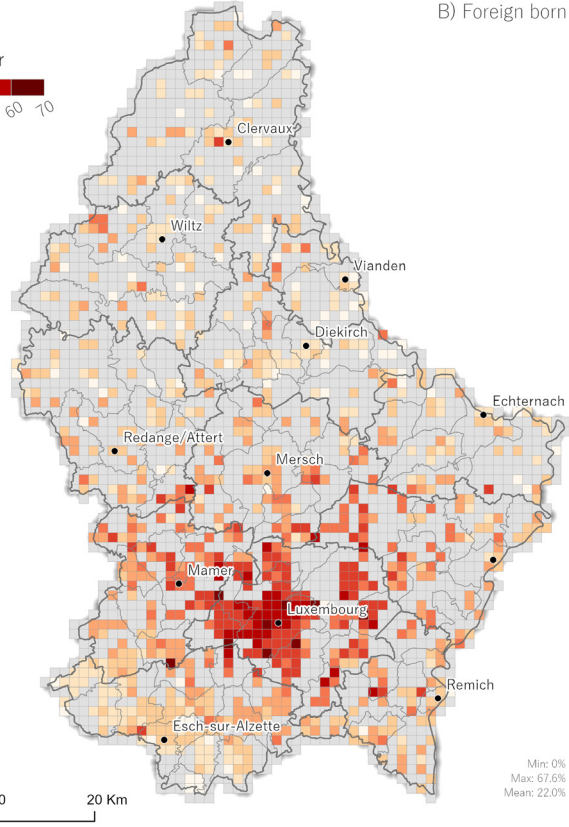
Map 2 below also shows the differences in distance to the centre for people born in Luxembourg and immigrants. Once again, we can see the strong centrality of the highest levels of education around Luxembourg City, demonstrating this 'income' effect on the residential location of people born in Luxembourg as well as immigrants, but also differences in the percentages per cell and per municipality depending on the country of birth.

Map 2: Percentage of residents with a Master's degree or higher by country of birth (Luxembourg or foreign) per 1 km cell and per municipality in 2021

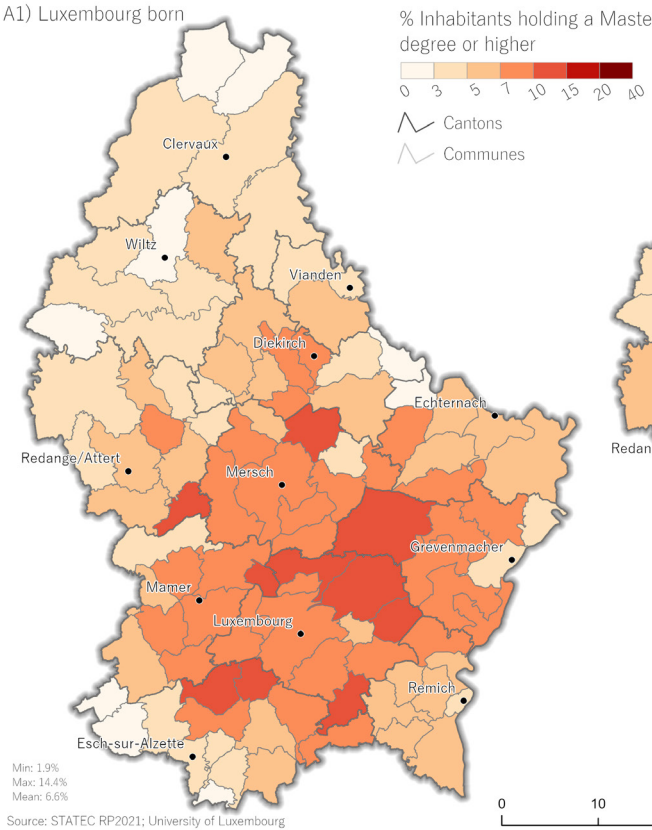
A) Luxembourg born



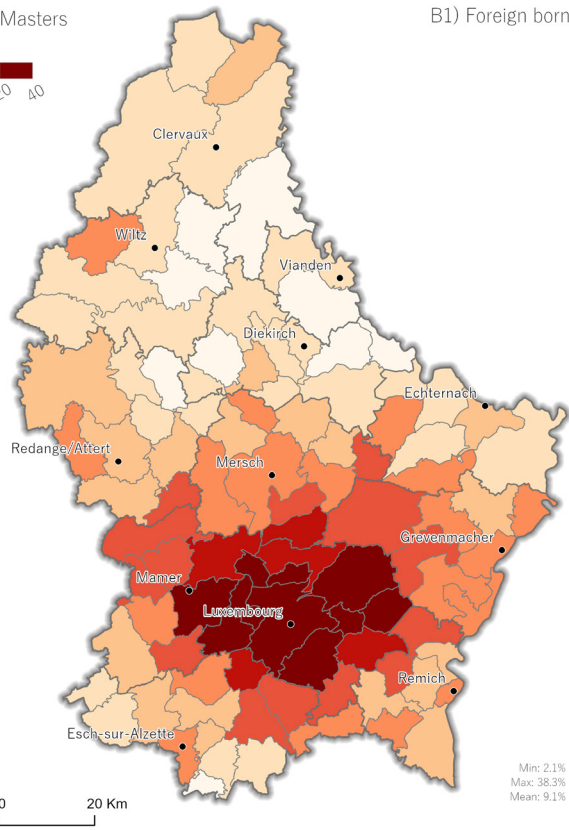
B) Foreign born



A1) Luxembourg born



B1) Foreign born



Note: Percentage of the population with a Master's degree or higher born in Luxembourg (A and A1) or abroad (B and B1) among the non-student resident population aged over 15 who provided a level of education by 1km cell and by municipality.

The proportions of foreigners with a Master's degree or higher are significantly higher in Luxembourg City, the outlying municipalities, Esch-sur-Alzette and some border municipalities than in those in the north of the country. For people born in Luxembourg, the highest proportions are found in the municipalities to the north-east of Luxembourg City (Niederanven, Junglinster, etc.). The fall in the proportion of Masters and above moving away from Luxembourg City is more marked for people born abroad than for the native-born.

Although the geographical breakdowns by municipality and by cell have similar structures, local differences are apparent. For example, on the maps by cell, the capital is highly contrasted as far as native-born people are concerned, with highly variable percentages of Masters and above. For foreign-born people, Belval and the municipalities of Bourscheid and Putscheid also illustrate these differences.

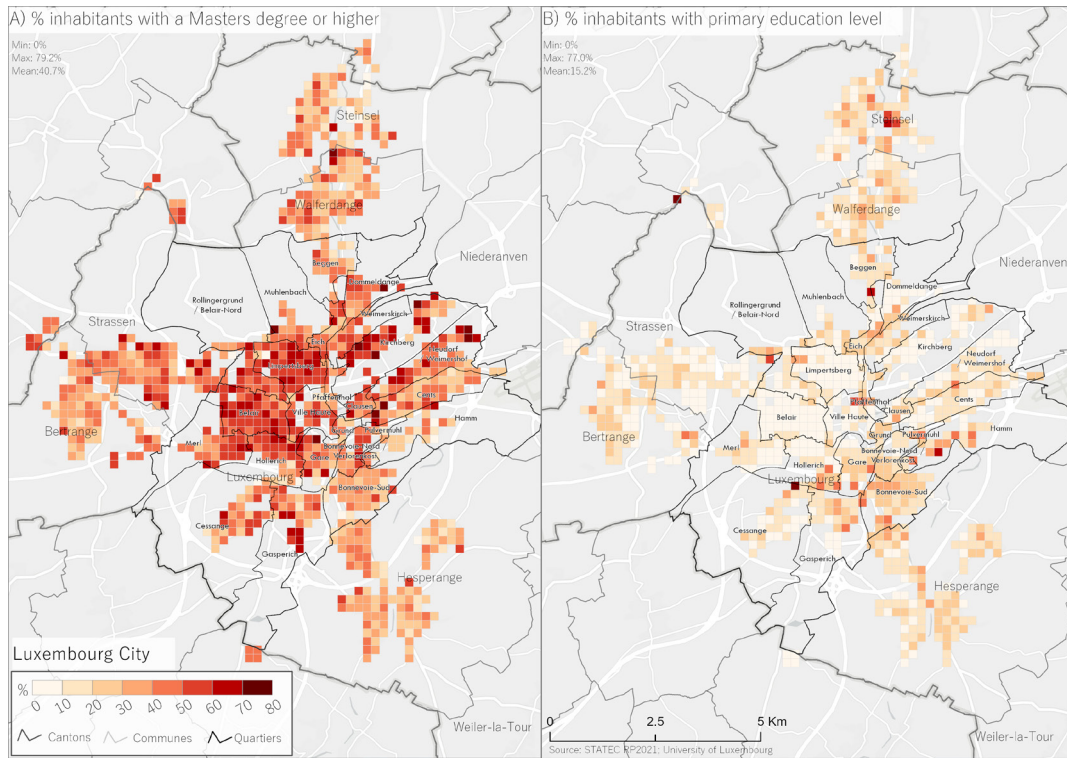
3.3 Focus on intra-urban differences

Finally, we zoom in on the Southern Conurbation and the Luxembourg conurbation (defined according to urban continuities, see publication number 7 in this series¹⁰) in order to perceive any more local residential concentrations. We use a 200m grid (maps 3 and 4).

In the south of the capital, the neighbourhoods of La Gare and Bonnevoie, traditionally home to a high percentage of immigrants, have relatively lower percentages of people with a Master's degree or higher, and therefore higher percentages of people with a lower secondary education. This is because immigration has been going on for longer and the levels of qualification are lower. Conversely, the western ring of Luxembourg City, including Merl, Belair, Limpertsberg and Kirchberg, has a very high percentage of people with a Master's degree or higher, and few with a lower secondary diploma. The same is true of Gasperich, which has been affected by new construction near the Cloche d'Or and has direct access to the motorway. So here we find the income effect mentioned above, but on a more local scale and reinforcing the idea of proximity to a community of belonging.

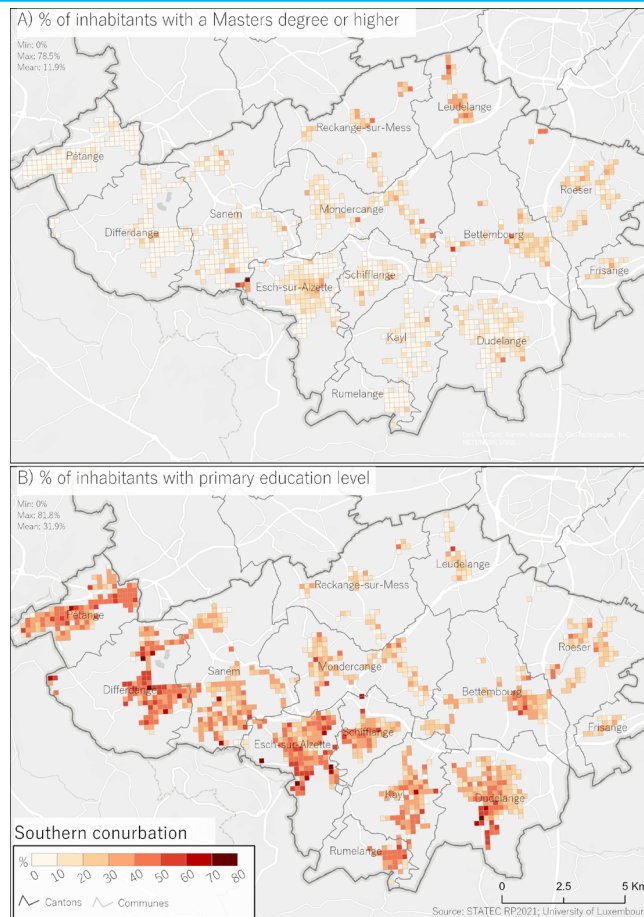
¹⁰ See RP 1st resultats 2021 N°07 "Spatial distribution of the population in Luxembourg: from the sub-municipal scale to the urban structure".

Map 3: Location of residents with the most and least qualifications in Luxembourg City and the surrounding area by 200m cell in 2021



Note: Percentage of non-student residents with a Master's degree or higher (A) and holders of a lower secondary diploma (B) per 200m cell in Luxembourg City.

Map 4: Location of residents with the most and least qualifications in the Southern Conurbation by 200m cell in 2021



Note: Percentage of non-student residents with a Master's degree or higher (A) and those with a lower secondary diploma (B) per 200 m cell in the Southern Conurbation

For the Southern Conurbation, map 4A shows the shares of holders of Master's degrees and above, and map 4B shows the shares of holders of lower secondary education, just as for Luxembourg-City, but the differences in percentages can be seen directly. The Southern Conurbation has very few residents with a Master's degree or higher, with the very clear exception of Belval, a new university district offering new housing and close to highly qualified jobs. This fact is all the more remarkable given that we exclude students from the analyses (see methodological insert).

Individuals' levels of education and their respective locations in the region are the result of rapid growth and migration in a specific urban context characterised by a highly attractive capital city, a former industrialised area and very local neighbour-hood effects. In addition, there have been generational and political changes relating to access to education and the arrival of migrants with varying degrees of qualifications.

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AUTHORS

This publication was produced by:

Louis Chauvel, Etienne Le Bihan, Geoffrey Caruso, Yann Ferro, Kerry Schiel, Isabelle Pigeron-Piroth (University of Luxembourg), Frédéric Docquier (LISER)

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For further information

Press Office

Tel 247-88 455

press@statec.etat.lu

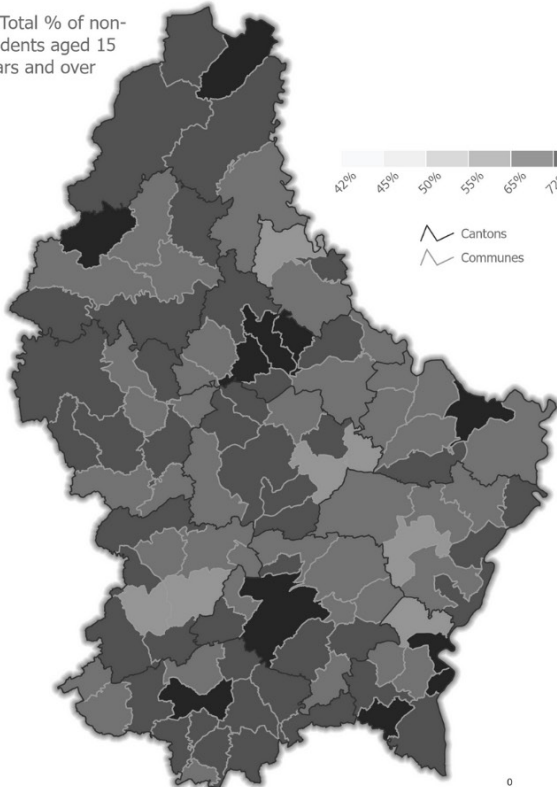
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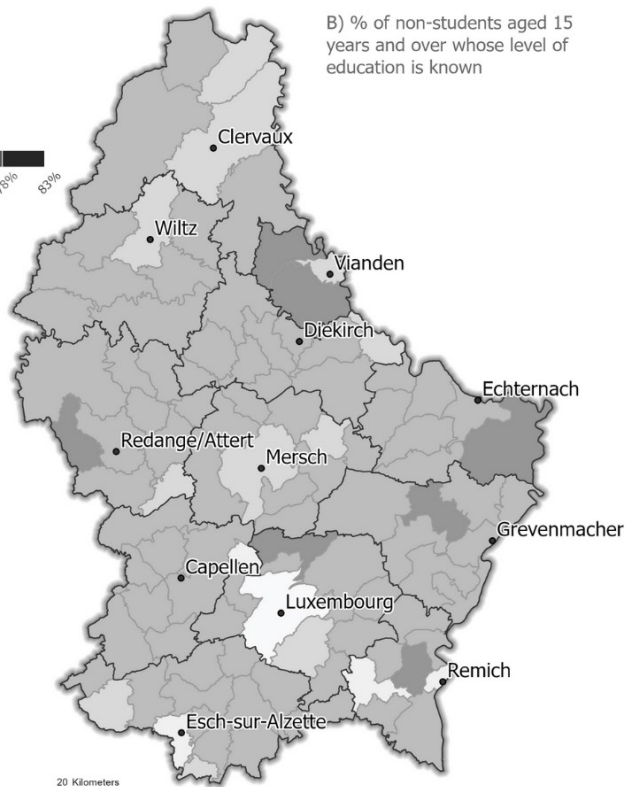
Appendices

Map A1. Non-student population aged 15 and over (A) and whose level of education is known (B) by municipality in 2021

A) Total % of non-students aged 15 years and over



B) % of non-students aged 15 years and over whose level of education is known



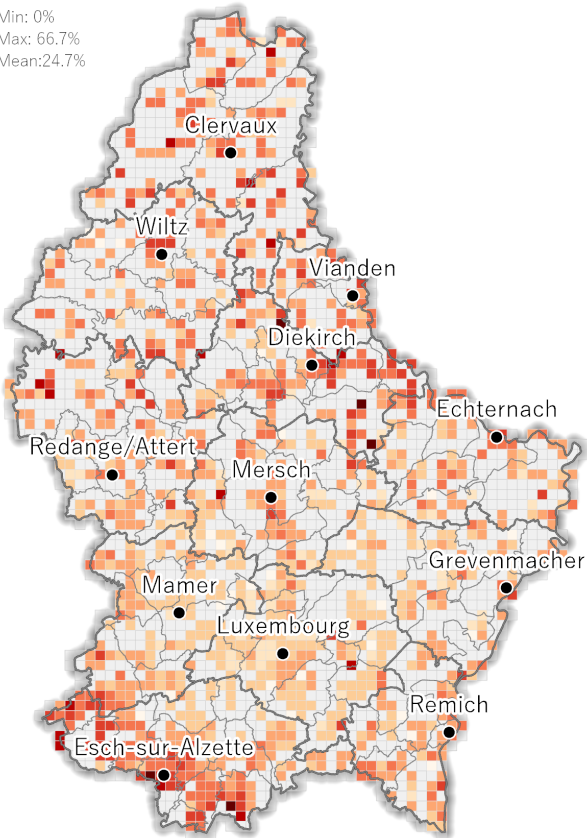
Source : STATEC, RP2021, University of Luxembourg

Note: A (left): Percentage of the population aged 15 and over not having student status among the resident population of the municipality. B (right): Percentage of the population aged 15 and over not having student status and having indicated a level of education among the population of the municipality having indicated its level of education.

Map A2. Non-student population aged 15 and over by level of education per 1 km cell in 2021

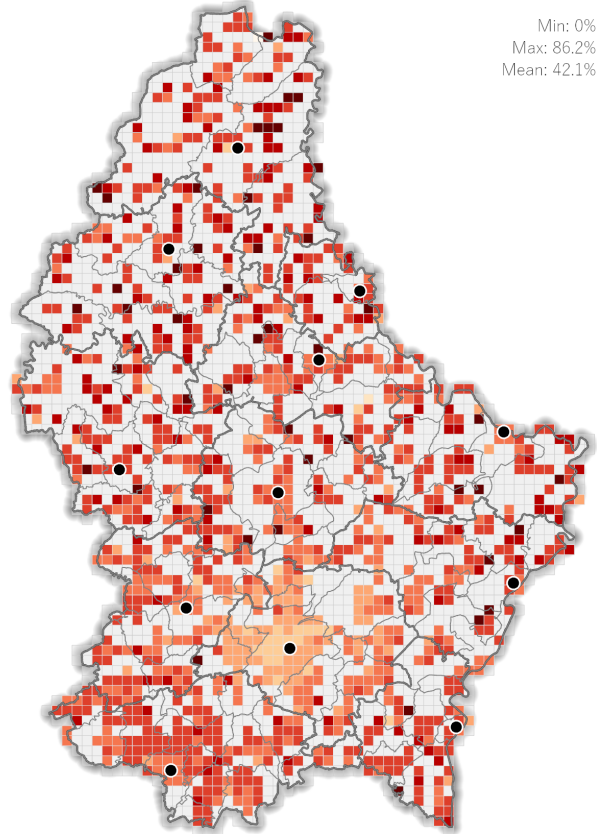
A) Lower secondary and below

Min: 0%
Max: 66.7%
Mean: 24.7%

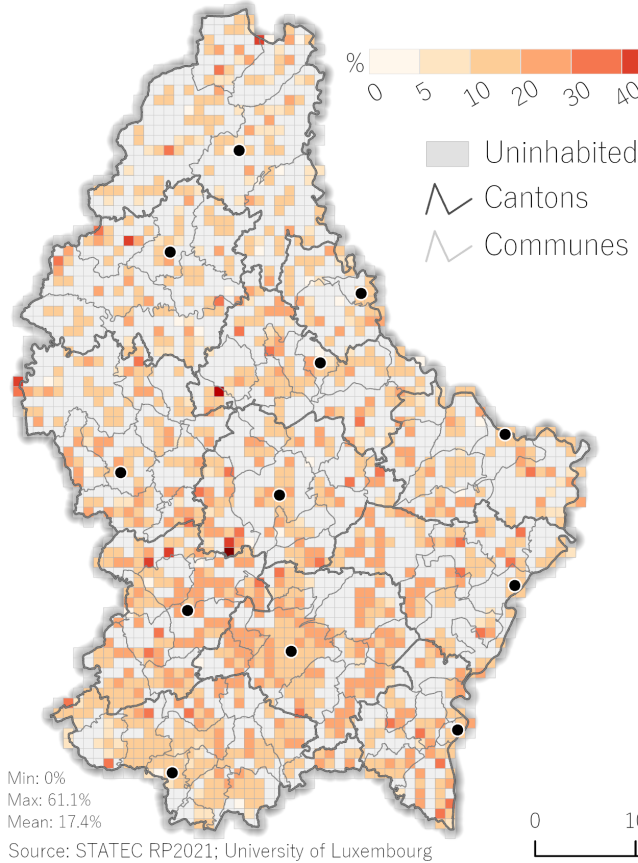


B) Upper secondary

Min: 0%
Max: 86.2%
Mean: 42.1%



C) Bachelor, tertiary and superior



D) Masters and above

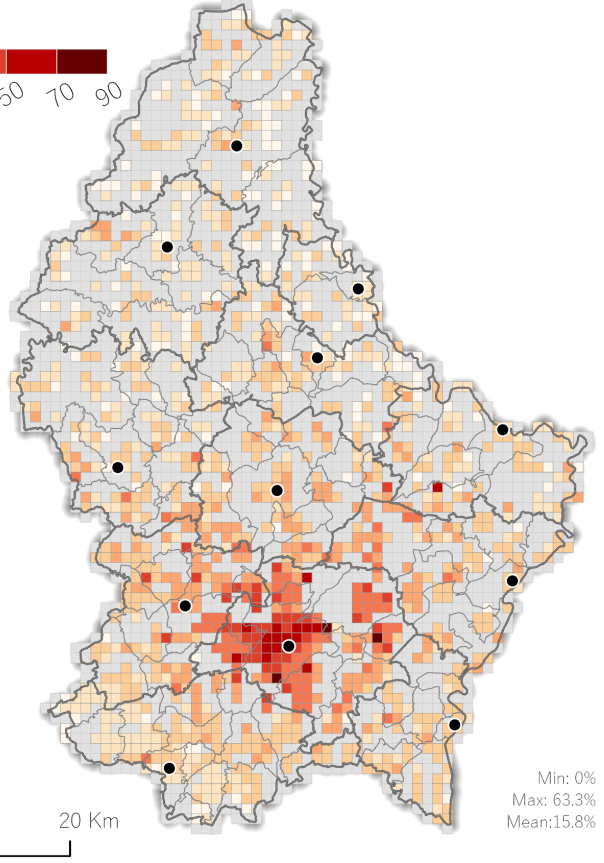


Table 10a: Country of completion of studies for foreign-born people with a Bachelor's degree and higher, by generation in 2021 (year of birth, %)

Country of completion of studies	g.1957-61	g.1962-66	g.1967-71	g.1972-76	g.1977-81	g.1982-86	g.1987-91	g.1992-96
Germany	8.0%	8.8%	6.9%	4.0%	3.2%	3.9%	3.7%	5.0%
Austria	0.3%	0.3%	0.4%	0.2%	0.1%	0.2%	0.3%	0.5%
Belgium	22.8%	24.5%	19.9%	15.9%	11.1%	9.2%	9.7%	12.1%
France	16.2%	16.9%	19.0%	21.1%	18.5%	14.4%	10.6%	11.7%
Luxembourg	6.2%	6.2%	7.4%	7.0%	6.5%	7.7%	9.9%	13.5%
United Kingdom	8.7%	7.1%	6.9%	5.6%	6.2%	4.6%	5.5%	5.8%
Switzerland	0.5%	0.6%	0.3%	0.6%	0.3%	0.3%	0.3%	0.6%
Other countries	37.2%	35.7%	39.3%	45.6%	54.1%	59.6%	60.0%	50.9%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Table 10b: Country of completion of studies for foreign-born individuals with a Master's degree or higher, by generation in 2021 (year of birth, %)

Country of completion of studies	g.1957-61	g.1962-66	g.1967-71	g.1972-76	g.1977-81	g.1982-86	g.1987-91	g.1992-96
Germany	12.6%	12.5%	10.5%	6.7%	6.6%	5.6%	4.9%	12.6%
Austria	1.0%	1.0%	1.1%	0.7%	0.8%	0.8%	0.7%	1.0%
Belgium	21.5%	20.1%	17.3%	12.2%	8.4%	6.8%	7.2%	21.5%
France	21.3%	20.4%	24.4%	26.2%	26.6%	27.5%	28.1%	21.3%
Luxembourg	1.3%	2.5%	2.8%	3.1%	4.1%	5.9%	7.3%	1.3%
United Kingdom	6.6%	6.0%	6.3%	6.2%	6.0%	5.6%	5.9%	6.6%
Switzerland	1.0%	0.9%	0.7%	0.8%	0.7%	0.7%	0.9%	1.0%
Other countries	34.8%	36.6%	36.7%	44.1%	46.8%	47.1%	45.0%	34.8%
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%