# Migration Report


**Priya Ravindra Dingorkar**
BE in CE & Pursing Master of Business Analytics

**Aarathy Babu**
B.Tech

**Junhao Wang**
B.Accounting

**Dilinie Seimon**
BSc.


Report for
Australian Government COVID19

**11 June 2020**


**ETC5513, Group 11**
**Junhao &**
**Aarathy &**
**Dilinie &**
**Priya**

(03) 9905 2478
questions@company.com

ABN: 12 377 614 630

## Acknowledgements

It gives, us immense pleasure and sincere gratitue to Dr Patricia Menéndez lectures and the tutorial sessions conducted by the tutors Stephanie Kobakian Mark Dulhunty, and Pablo Montero Manso. It only because of the culminative efforts that we am in the position to produce this report and display our knowledge over the github tools.

## Abstract

There is no doubt that globalization is here to stay and that it continues to intensify and to reshape our identities and living spaces. **Migration** is one important factor that enhances globalisation and helps in cultural, socio and economic changes in a large scale. This report will focus on the certain aspects of migration.

## Introduction

Migration is the movement of people from one place to another with the intentions of settling, permanently or temporarily, at a new location. We are looking at a dataset from the database of OCED. In order to understand further analysis let us look at some of the important defination required to understand this report.

What is OECD ?

The Organisation for Economic Co-operation and Development (OECD) is a group of 34 member countries that discuss and develop economic and social policy. OECD members are democratic countries that support free-market economies

What is ISCED ?

The International Standard Classification of Education is a statistical framework for organizing information on education maintained by the United Nations Educational, Scientific and Cultural Organization. It is a member of the international family of economic and social classifications of the United Nations.

What is ISCO ?

The International Standard Classification of Occupations is an International Labour Organization classification structure for organizing information on labour and jobs.

This report focuses on the migration dataset from the year 2015 to 2016. The OECD makes data available for use and consultation by the public under the license **CC BY-NC-SA 3.0 IGO**. This license allows us to share and modify data apart from commerical uses and has strict restrictions of attribution.

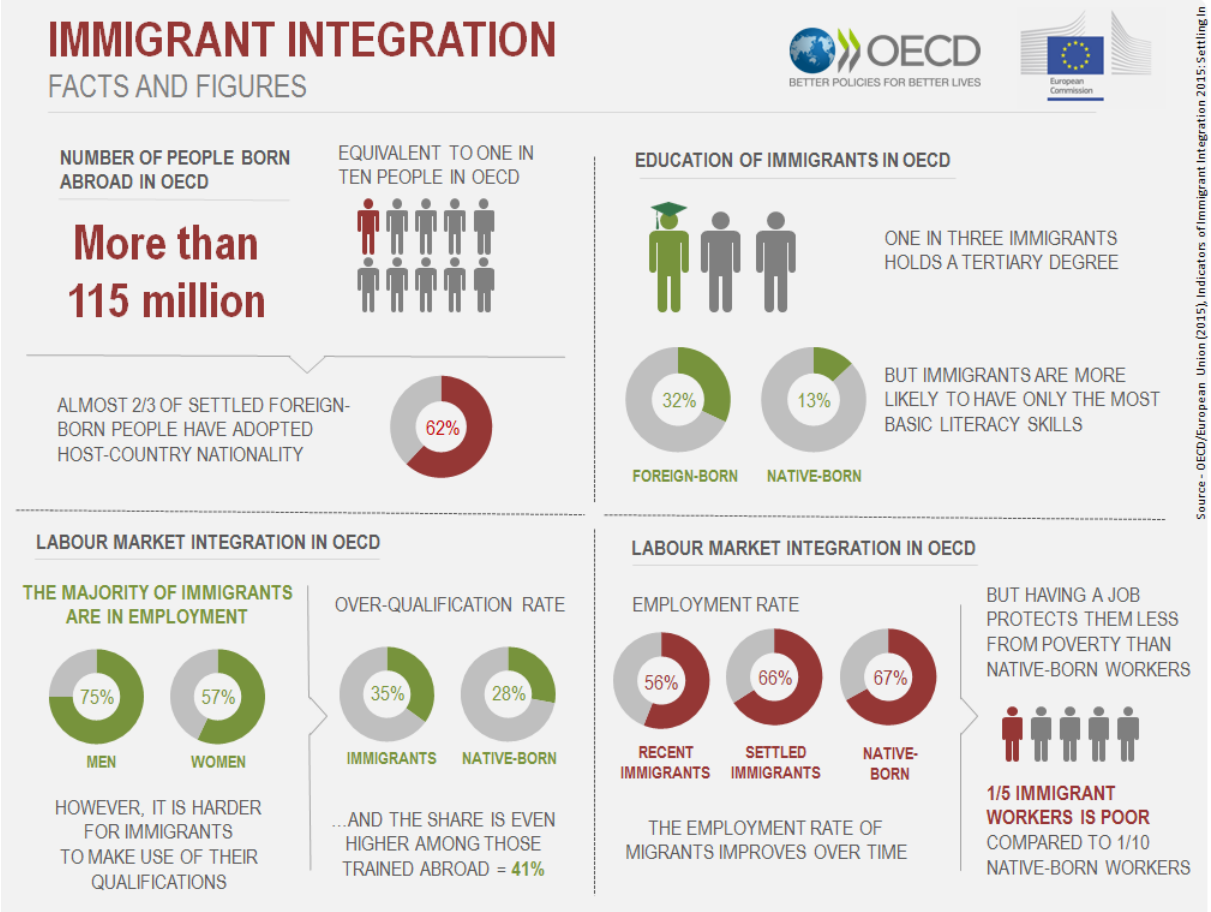



**Figure 1:** *Migration Facts and Figures*

## Motivation

Dilinie please add this(adding a little bit of data sources and a gist of all the reserach question in maybe 100-200 words.)

## Data Source

(http://www.oecd.org/els/mig/dioc.htm)(link to the original dataset) Dilinie requesting you to the add the link to our where our dataset has been taken from. Also please add explanation of the data sources, also requestin you to explain the varibles before this.

Also you can mention a few lines about the high importance of clean and understanable metadata

Comprehensive metadata can also enable data sets designed for a single purpose to be reused for other purposes and over the longer term. Please also write the importance of metadata.

## Research Ethics

Dataset used in the report for analysis, has a lot of unknown values due to confidelity issues and the methods used to ensure reliability and protect confidentiality. Major principles of research ethics have been used in this report no labels or absurd statements have been made keeping in mind obtain informed consent from potential research participants, minimise the risk of harm to participants, protect their anonymity and confidentiality, avoid using deceptive practices and give participants the right to privacy.

## Methodology

Every migrant analyzes a few factors of the destination country before actually setttling permanently or temporarily. Some of the factors are which are the best destination countries, what are the job oppurunities, what is the unemploymnet rate, what is the level of eductaion and their recoginition worldwide, and similar many other factors. But our report is a live dataset from the past years and shows true analysis of what is the current situation of migration across the globe and particularly about Australia as well. Since our dataset is large and contains many files this report only focuses on four research questions, giving all of us a gist about the state of migration and migrants, across the world.

## Research Questions

There research question we have aimed to answer are as follows:

- The top destinations for migration, the gender difference in migration in total and across different age groups
- Identifying the relationship between unemployment and education level as well as the gender gap in unemployment
- Analysing the level of education of residents of Australia versus the duration they have been in Australia.
- Distribution of various skill levels, types of occupation and overqualified population across the globe in different continents

**Table 1:** *Top 10 destinations*

| Country | Migrant_Count |
|---|---|
| United States of America | 323127504 |
| Japan | 127094759 |
| Mexico | 119561904 |
| Germany | 82424843 |
| Tunisia | 78741055 |
| France | 66190412 |
| United Kingdom | 64381731 |
| Italy | 60383365 |
| Korea | 48141031 |
| Spain | 45977782 |

## Migration and Gender Gap

Throughout history, humans have migrated for various reasons that could be classified as economic, social, political, etc. This section focuses on the preferred destination countries for migration as well as the gender difference across age groups in the migrant population in destination countries.

The table 1 depicts the preferred destinations for migration in the year 2015/16. Historically, the USA have been the most popular destination for migration and has remained the same in the year 2015-16, with the most preferred destinations being the USA, Japan, and Mexico across all ages.

Among the international migrants, 50.94 % are females and 49.06 % are males. Figure 2 shows the gender gap in each country's migrant population and it is observed that in 2015-16, women constituted more in the migrant population especially in the top preferred destinations like the USA, Japan, etc whereas the gap is relatively low in countries like Belgium, Finland, etc.

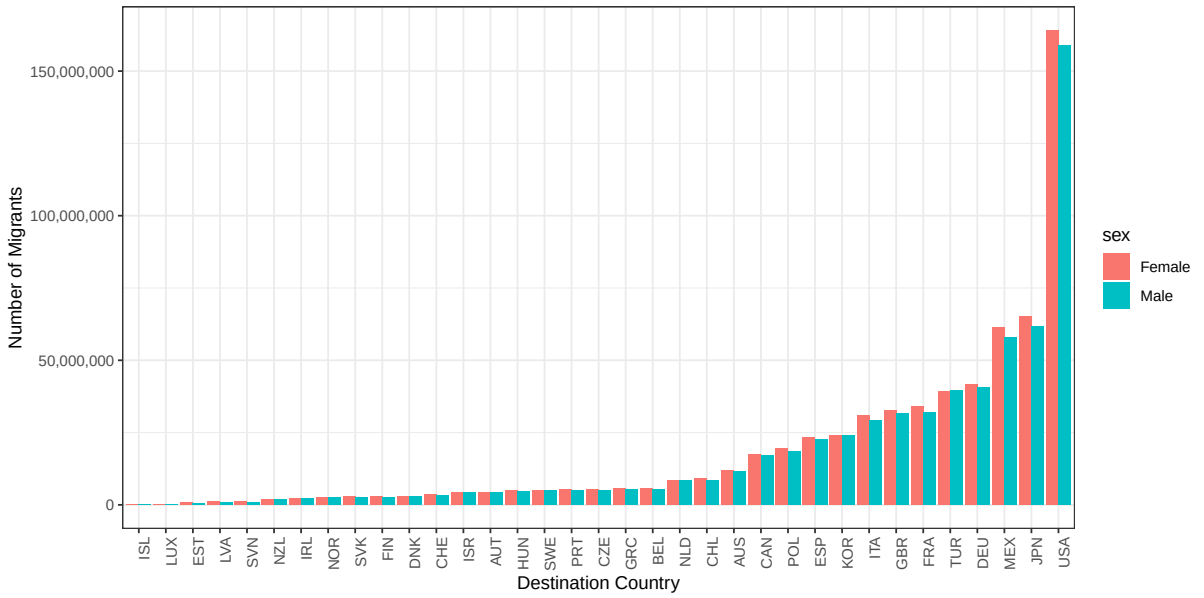



**Figure 2:** *Gender difference in migrant population in countries*

In 2015-16, the most number of migrants fell in the age group 25-64, with females being higher in number compared to males in countries like the USA, Mexico, Germany, etc. In countries like Japan, Korea and Spain it can be seen that there is no gender gap in the migrant population of age group 25-64 whereas in countries like Poland and Turkey the number of males is higher than females for the same age group. Amongst the age group 15-24, there is a relatively low gender difference in the migrant population compared to the other age groups and the trend is uniform in almost all the countries whereas amongst the migrants who are 65 years old and above, the number of females is higher than that of males in the USA, Japan , Italy, etc and Mexico being one of the top destinations for migration, saw an influx of an equal number of males and females aged over 65 in the year 2015-16.

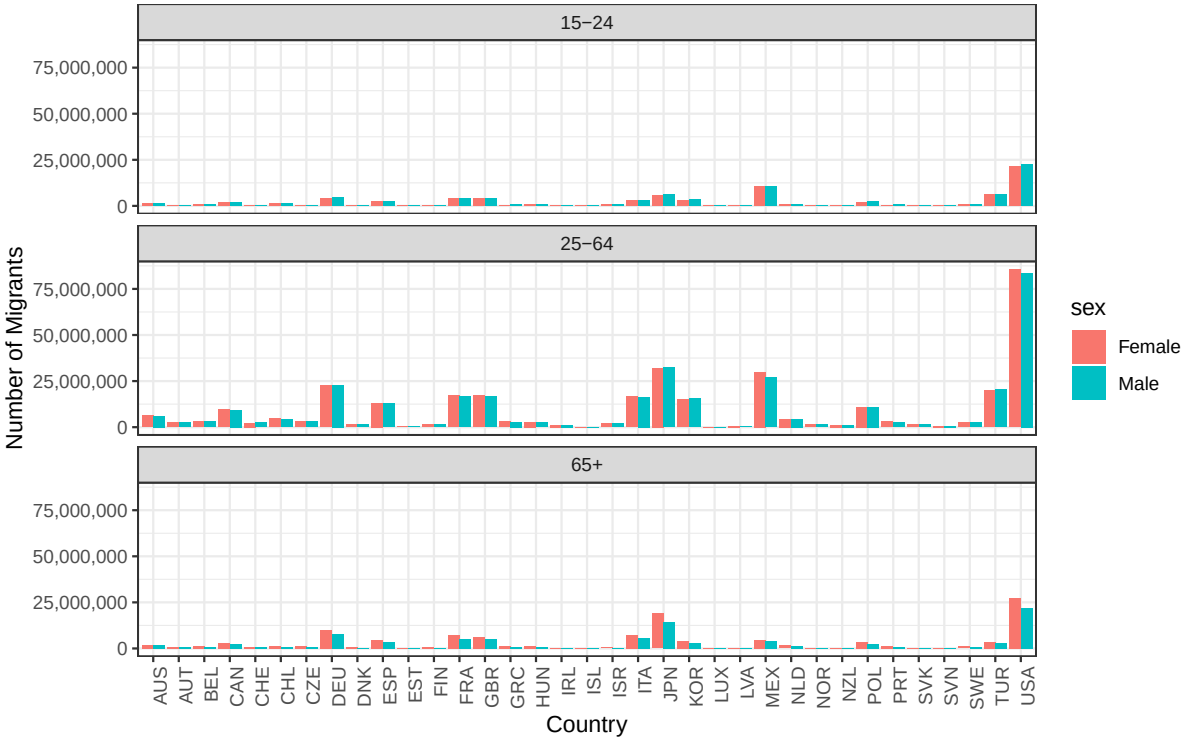



**Figure 3:** *Gender difference in migrant population across age groups in countries*

### Unemployment and Education level

## The Education Level of Australian Residents

In the past few decades, Australia has acquired many skilled migrants, contributing substantially towards the local economy. Hawthorne (2010) states that by 2007, two thirds of them were former international students recruited in Australia rather than offshore applicants. This transition has also been named as the “two-step-migration” by Hawthorne (2010).

This section will analyse the education levels of current residents of Australia categorized by their duration of stay in the country.

The dataset provides information on the education levels of Australian residents and their duration of stay within the country.

The residents of Australia have been categorized based on their duration of stay within the country as

- native born
- less than 5 years
- between 5 - 10 years
- more than 10 years

The level of education has been categorized using a broad three-category classification as

- low
- medium
- high

However the duration of stay of 25.9% of Australian residents is unknown, while the education level of 24.6% residents is unknown. These values will also be used in the analysis as unknowns, to provide a more accurate overlook on the overall numbers.

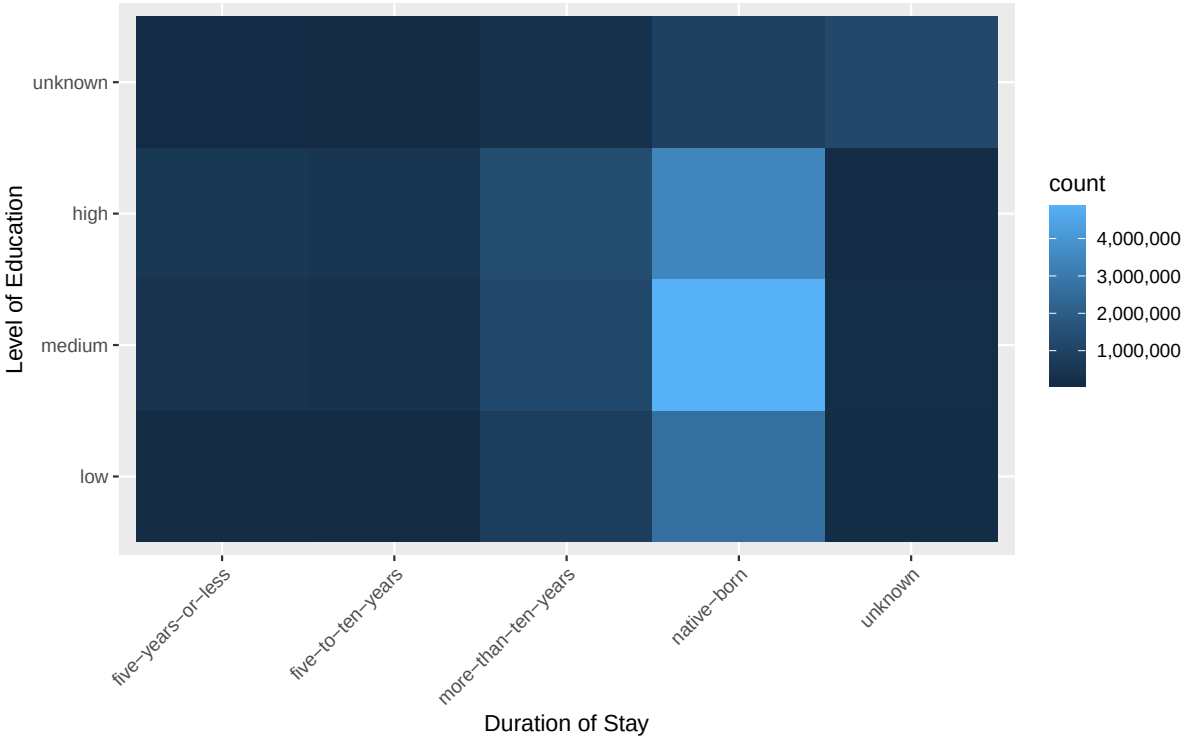



**Figure 4:** *Breakdown of Australian residents based on their level of Education and duration of stay in Australia*

Figure 4 shows the breakdown of Australian residents based on their duration of stay in Australia and their level of education; the higher counts of residents are represented by light blue and the lower number of residents are represented by dark blue. The dataset contains a few unknowns about the Australian resident, some on the level of education and some on the duration of stay, which is also represented in figure 4.

It's obvious that the highest counts of Australian residents are natives, and is interesting that a majority of them have a medium level of education, followed by natives having a higher level of education and only a few of them having a low level of education. It's also interesting how the numbers of Ausralian residents who have been in the country for over ten years, shows higher counts of numbers

than those who have been in the country for a lower duration of time. It can also be seen that in all three categories of non-native born Australians, most have received a high level of education.

**Table 2:** *Percentages of Australian residents with different levels of education over each category of duration of stay*

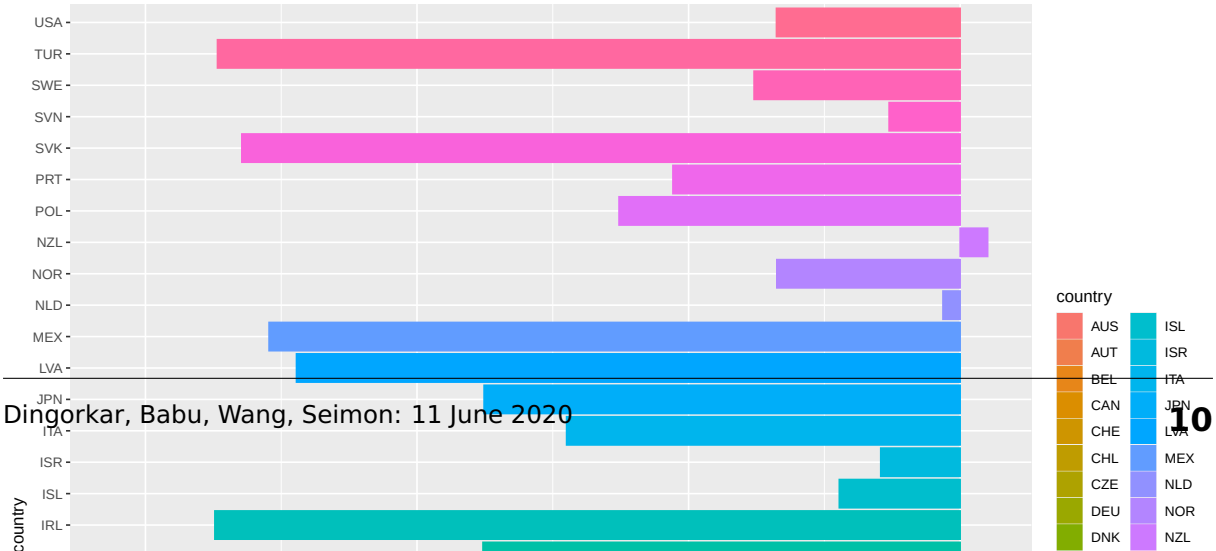
| Duration of stay | High level of education (%) | Medium level of education (%) | Low level of education (%) | Unknown level of education (%) |
|---|---|---|---|---|
| five-to-ten-years | 54% | 31% | 9% | 5% |
| five-years-or-less | 50% | 34% | 10% | 6% |
| more-than-ten-years | 37% | 34% | 21% | 8% |
| native-born | 29% | 41% | 22% | 8% |

A breakdown of Australian residents with different durations of stay, into their level of education is represented in table 2. It can be seen that the majority of individuals who have obtained residency in Australia recently have a high level of education while only a few of them have a low level of education. A significant increase in percentages of individuals with higher levels of education obtaining residency in Australia can also be seen from table 2. Most native-Australians (41%) have a medium level of education, while others with shorter durations of stay in Australia have much higher levels of education.

Green, Kler, and Leeves (2007) states that the immigration policies in Australia has placed an increased focus in skill-based selection criteria, and has resulted in overeducation of recently arrived Australian immigrants. This can be attributed to the most of the recent immigrants having a high level of education as represented by figure 4 and table 2.

**Table 3:** *unemployment gendergap*

| country | unemployrateM | unemployrateF | unemployrateGAP |
|---|---|---|---|
| AUS | 4.862303 | 4.0115099 | -0.8507930 |
| AUT | 5.336735 | 3.9353913 | -1.4013437 |
| BEL | 4.347939 | 3.2985616 | -1.0493775 |
| CAN | 5.778106 | 4.3270743 | -1.4510321 |
| CHE | 3.865908 | 3.2144728 | -0.6514349 |
| CHL | 4.809590 | 3.9577202 | -0.8518701 |
| CZE | 2.396411 | 2.4515907 | 0.0551801 |
| DEU | 2.936210 | 2.0469143 | -0.8892954 |
| DNK | 2.148729 | 2.1059917 | -0.0427379 |
| ESP | 10.985712 | 10.8943528 | -0.0913595 |
| EST | 5.300859 | 3.4574224 | -1.8434366 |
| FIN | 9.559730 | 6.8315897 | -2.7281404 |
| FRA | 8.392850 | 7.8781252 | -0.5147248 |
| GBR | 3.663103 | 2.8918511 | -0.7712517 |
| GRC | 10.585938 | 7.4697667 | -3.1161718 |
| HUN | 7.512527 | 5.7554851 | -1.7570423 |
| IRL | 9.371130 | 6.6267541 | -2.7443755 |
| ISL | 3.634079 | 3.1891160 | -0.4449626 |
| ISR | 3.226836 | 2.9344538 | -0.2923819 |
| ITA | 6.557226 | 5.1080372 | -1.4491892 |
| JPN | 3.452669 | 1.6996869 | -1.7529817 |
| KOR | NA | NA | NA |
| LUX | 46.543493 | 35.7410219 | -10.8024711 |
| LVA | 7.869852 | 5.4260483 | -2.4438039 |
| MEX | 3.497137 | 0.9523001 | -2.5448371 |
| NLD | 3.881309 | 3.8180653 | -0.0632437 |
| NOR | 2.147195 | 1.4721626 | -0.6750323 |
| NZL | 3.579875 | 3.6812728 | 0.1013976 |
| POL | 7.015866 | 5.7597853 | -1.2560810 |
| PRT | 7.032256 | 5.9746734 | -1.0575825 |
| SVK | 11.368361 | 8.7232843 | -2.6450766 |
| SVN | 4.902322 | 4.6408436 | -0.2614786 |
| SWE | 3.838277 | 3.0794607 | -0.7588166 |
| TUR | 7.266447 | 4.5316713 | -2.7347755 |
| USA | 3.955071 | 3.2786733 | -0.6763982 |



Analysis:

We can draw conlusion from 5 thatGenerally speaking, gender gap in unemployment rate does exist, the unemployment rate gaps are negative in most country, this means female have lower unemployment rate than male.

**Table 4:** *unemployrate on different level of education*

| country | educationlevel | unemployRATE |
|---|---|---|
| AUS | high | 0.0354576 |
| AUS | low | 0.0443595 |
| AUS | medium | 0.0532527 |
| AUS | unknown | 0.0358913 |
| AUT | high | 0.0311428 |
| AUT | low | 0.0701552 |
| AUT | medium | 0.0457923 |
| AUT | unknown | NaN |
| BEL | high | 0.0298011 |
| BEL | low | 0.0431251 |
| BEL | medium | 0.0461857 |
| BEL | unknown | 0.0122354 |
| CAN | high | 0.0452058 |
| CAN | low | 0.0517304 |
| CAN | medium | 0.0601727 |
| CHE | high | 0.0328462 |
| CHE | low | 0.0416613 |
| CHE | medium | 0.0336930 |
| CHL | high | 0.0179900 |
| CHL | low | 0.0427796 |
| CHL | medium | 0.0498058 |
| CHL | unknown | 0.0527589 |
| CZE | high | 0.0167868 |
| CZE | low | 0.0409399 |
| CZE | medium | 0.0226775 |
| CZE | unknown | 0.0487416 |
| DEU | high | 0.0160581 |
| DEU | low | 0.0374303 |
| DEU | medium | 0.0236941 |
| DEU | unknown | 0.0093930 |
| DNK | high | 0.0231097 |
| DNK | low | 0.0177326 |
| DNK | medium | 0.0225601 |
| DNK | unknown | 0.0210787 |
| ESP | high | 0.0880976 |
| ESP | low | 0.1186934 |
| ESP | medium | 0.1216533 |
| ESP | unknown | 0.0000000 |
| EST | high | 0.0286894 |
| EST | low | 0.0441750 |

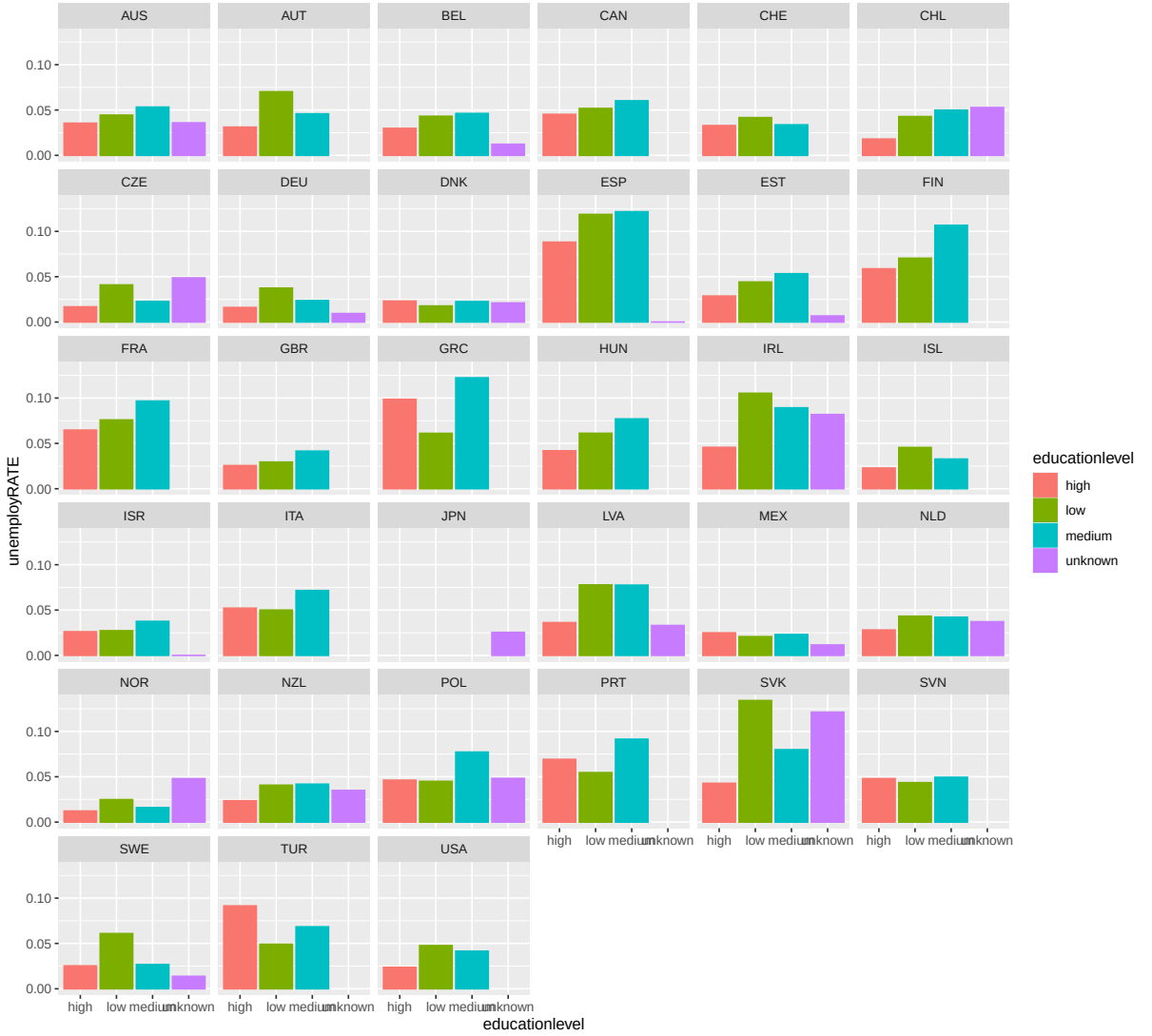



**Figure 6:** *(#fig:ed_un)unemployment rate among different education level*

Analysis:

**??** Generally speaking, most have lower unemployment rate compared to low education level groups, but this is not the case in TUR,PRT,RGC AND ITA.

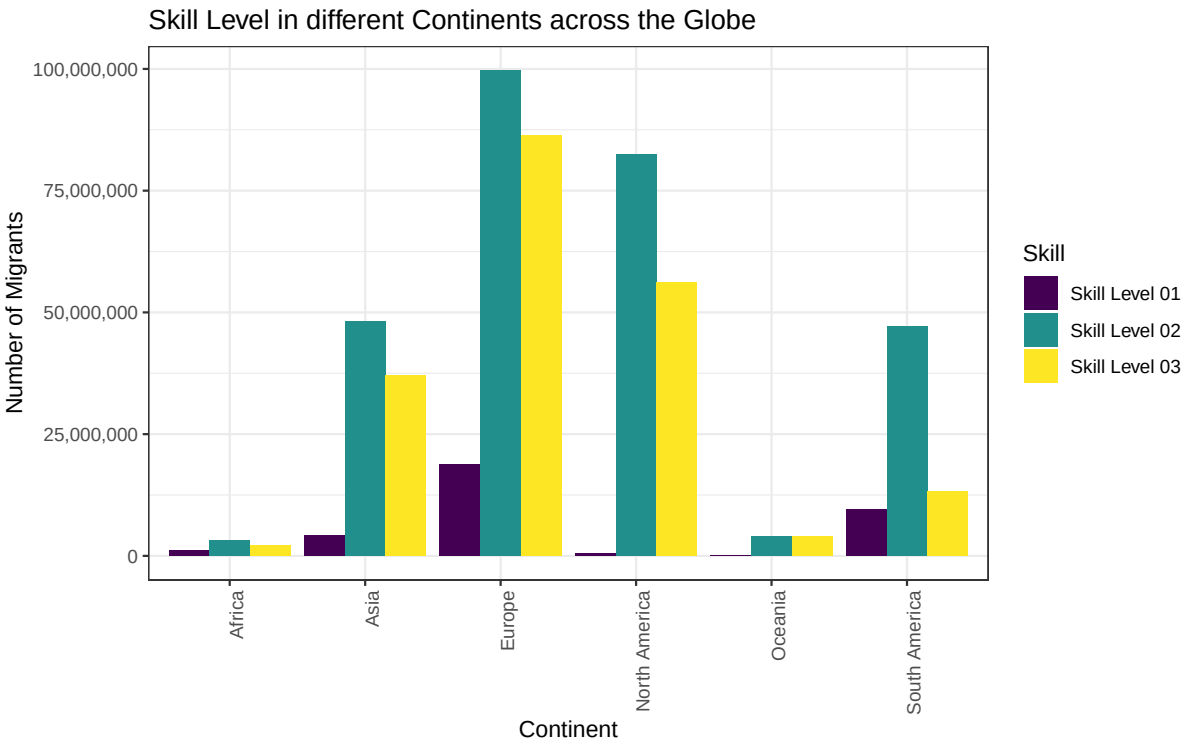



**Figure 7:** *Types of Skill*

In figure 7 talks about the different **Skill Levels**. It is defined as a function of the complexity and range of tasks and duties to be performed in an occupation into groups that people have across the globe in. Let us understand the different skills. Skill Level 01 typically involve the performance of simple and routine physical or manual task, these task require physical strength and/or endurance. Skill Level 02 typically involve the performance of tasks such as operating machinery and electronic equipments, they should also have the ability to read and write to a certain extend. Skill Level 03 involves the performance of complex technical and practical tasks that require an extensive body of factual, technical and procedural knowledge in a specialized feild, requires high level literacy and numeracy and well developed interpersonal communication skills. The graph here shows that **Europe** have the highest number of migrants with all these skill levels. **North America** has very less migrants involved in skill level 01 and most migrants have skill level 02 and level 03. **South America** have more people with skill level 02 followed by skill level 03 and skill level 01. **Oceania** has verey few migrants with skill level 01 and people with skill level 02 and skill level 03. Most of the migrants in **Asia** have skill level 02 and skill level 03. **Africa** has very migrants with all the skill levels.

**Table 5:** *List of Occupations that people engage in after Migration*

| Occupations | Africa | Asia | Europe | North America | Oceania | South America |
|---|---|---|---|---|---|---|
| Armed Forced Occupations | 16578 | 134184 | 1161864 | 57483 | 78087 | 123354 |
| Clerical Support Worker Occupations | 346142 | 3335802 | 20918780 | 807736 | 854191 | 3722436 |
| Craft and Related trade Occupations | 507452 | 3238802 | 23205091 | 1746178 | 511284 | 8491454 |
| Elementary Occupations | 1039390 | 4126580 | 19477937 | 490819 | 63336 | 10020788 |
| Managerial Occupations | 295844 | 1351722 | 12933257 | 1541335 | 1050874 | 1736952 |
| Plant and Machine Operators and Assembler Occupations | 402639 | 3854407 | 14180541 | 741683 | 698375 | 5953850 |
| Professional Occupations | 820935 | 7401650 | 37449078 | 3015180 | 1699599 | 5056319 |
| Service and Sales Worker Occupations | 817080 | 4945890 | 31421967 | 2355201 | 1124498 | 11610410 |
| Skilled Agricultural, Forestry and Fishery Occupations | 187722 | 1537852 | 8223032 | 73344 | 784091 | 4668935 |
| Technicians and Associate Professional Occupations | 554736 | 5544054 | 34331795 | 2866619 | 1120886 | 3800846 |

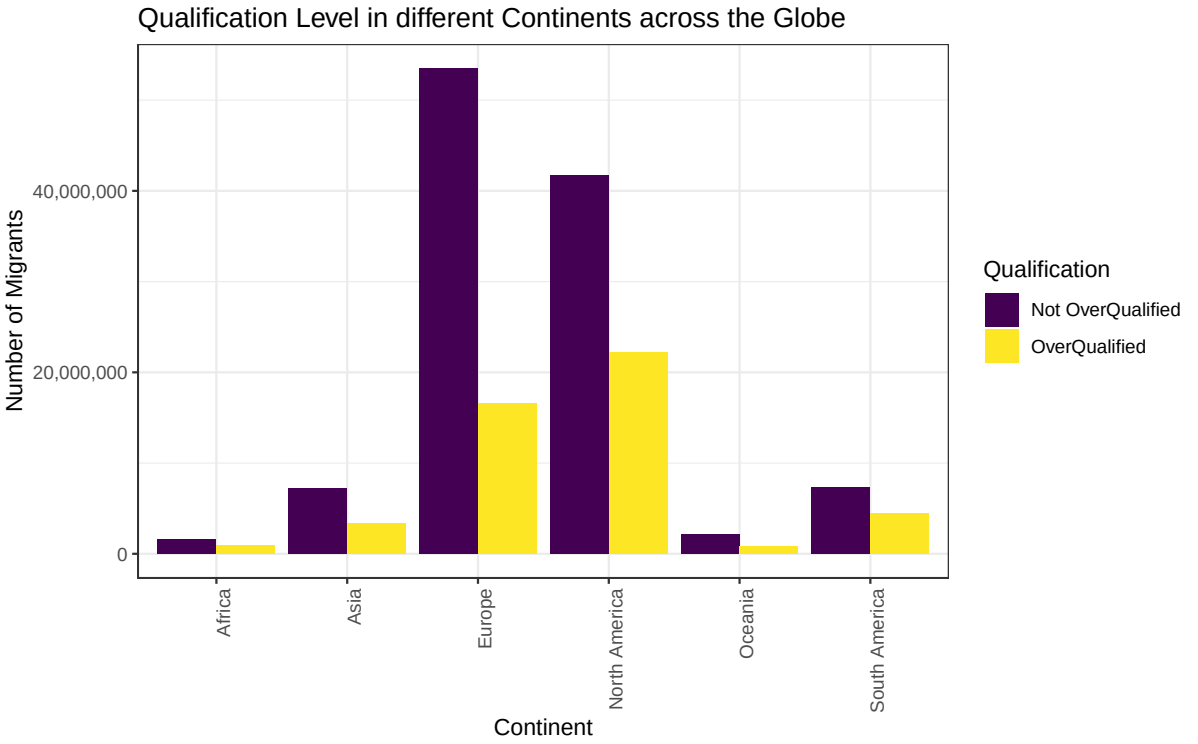



**Figure 8:** *Occupation Types*

In figure 8, Overqualified indicates whether a worker is highly educated for the job that he is doing in a particular continent with respect to their education attainment he has recieved. Looking at the figure closely, we have seen that, **North America** has the highest over qualified people, followed by **Europe**, **South America**, **Asia**, **Africa** and **Oceania**. Not overqualified here refers to that, most migrants have just the right level of education attainment. We see that the top three continents with the right qualification amongst the migrants are **Europe**, **North America** and **Asia**

In table 5 we see the different occupation (will explain rest of it in master to work in the master) in order to work in master.

## Limitations

The Database on Immigrants in OECD Countries (DIOC) 2015/16 provides information on age,duration of stay, labour force status and occupation of the migrants. The limitations of the dataset is as follows,

1. Confidentiality and Reliability issues

   Due to confidentiality issues, the place of birth is recorded at the continental level such as Africa, Asia, Europe, etc.instead of the country level in the dataset,therefore the analysis is focused on only the destination countries.Also,there is only limited details available on the important variables like educational qualification and skills.

2. Unavailability of data

   Unavailability of data on variables like age, skills,occupation ,labour force status and educational qualification proved to be a limitation to the analysis of the dataset.

3. Inconsistency of data

   The dataset contains inconsistency in data for example the reference population for Switzerland, Luxembourg and New Zealand is 15+ and there is no information on the age group 0-14. Due to this reason and the fact that 0-14 age group belongs to the minor category, the age group 0-14 was not considered for the analysis of gender gap in migrant population.

## Conclusion

Migrants have made significant impacts on socio-economic as well as the political sphere of a destination countries. From the analysis on the Database on Immigrants in OECD Countries (DIOC) released by The Organisation for Economic Co-operation and Development (OECD), we conclude the following,

1. In the year 2015-16 , 50.94
2. People between 25-64 years old migrated more compared to the other age groups in year 2015-16.

## Limitations

The Database on Immigrants in OECD Countries (DIOC) 2015/16 provides information on age,duration of stay, labour force status and occupation of the migrants. The limitations of the dataset is as follows,

1. Confidentiality and Reliability issues

   Due to confidentiality issues, the place of birth is recorded at the continental level such as Africa, Asia, Europe, etc.instead of the country level in the dataset,therefore the analysis is focused on only the destination countries.Also,there is only limited details available on the important variables like educational qualification and skills.

2. Unavailability of data

   Unavailability of data on variables like age, skills,occupation ,labour force status and educational qualification proved to be a limitation to the analysis of the dataset.

3. Inconsistency of data

   The dataset contains inconsistency in data for example the reference population for Switzerland, Luxembourg and New Zealand is 15+ and there is no information on the age group 0-14. Due to this reason and the fact that 0-14 age group belongs to the minor category, the age group 0-14 was not considered for the analysis of gender gap in migrant population.

## Conclusion

Migrants have made significant impacts on socio-economic as well as the political sphere of a destination countries. From the analysis on the Database on Immigrants in OECD Countries (DIOC) released by The Organisation for Economic Co-operation and Development (OECD), we conclude the following,

1. In the year 2015-16 , 50.94
2. People between 25-64 years old migrated more compared to the other age groups in year 2015-16.

## References


Bai, Y, L Yao, T Wei, F Tian, DY Jin, L Chen, and M Wang (2020). Presumed asymptomatic carrier transmission of COVID-19. *Jama* **323**(14), 1406–1407.

Green, C, P Kler, and G Leeves (2007). Immigrant overeducation: Evidence from recent arrivals to Australia. *Economics of Education Review* **26**(4), 420–432.

Hawthorne, L (2010). How valuable is "two-step migration"? Labor market outcomes for international student migrants to Australia. *Asian and Pacific Migration Journal* **19**(1), 5–36.

Hyndman, RJ (2016). *forecast: Forecasting functions for time series and linear models*. cran.r-project.org/package=forecast.

Hyndman, RJ and Y Khandakar (2008). Automatic time series forecasting: the forecast package for R. *Journal of Statistical Software* **26**(3), 1–22.

Hyndman, RJ and AB Koehler (2006). Another look at measures of forecast accuracy. *International Journal of Forecasting* **22**(4), 679–688.

ILO (2012). *International Standard Classification Of Occupations*. Accessed on 2020-06-04. https://www.ilo.org/public/english/bureau/stat/isco/docs/publication08.pdf.

OECD (2016). *Database on Immigrants in OECD Countries (DIOC) 2015/16*. Database on Immigrants in OECD Countries. Accessed on 2020-06-01. http://www.oecd.org/els/mig/dioc.htm.

OECD (2019). *The new immigrants Global trends in migration towards OECD countries between 2000/01 and 2015/16*. Accessed on 2020-06-05. http://www.oecd.org/els/mig/Migration-data-brief-4-EN.pdf.

Tierney, N, D Cook, M McBain, and C Fay (2020). *naniar: Data Structures, Summaries, and Visualisations for Missing Data*. R package version 0.5.0. https://CRAN.R-project.org/package=naniar.

*Variables, Coverage, Sources* (2016). OECD. http://www.oecd.org/migration/mig/methodology-DIOC-2015-2016.pdf.

Wickham, H, M Averick, J Bryan, W Chang, LD McGowan, R François, G Grolemund, A Hayes, L Henry, J Hester, M Kuhn, TL Pedersen, E Miller, SM Bache, K Müller, J Ooms, D Robinson, DP Seidel, V Spinu, K Takahashi, D Vaughan, C Wilke, K Woo, and H Yutani (2019). Welcome to the tidyverse. *Journal of Open Source Software* **4**(43), 1686.

Wickham, H, J Hester, and R Francois (2018). *readr: Read Rectangular Text Data*. R package version 1.3.1. https://CRAN.R-project.org/package=readr.

Wickham, H and D Seidel (2019). *scales: Scale Functions for Visualization*. R package version 1.1.0. https://CRAN.R-project.org/package=scales.

Xie, Y (2016). *bookdown: Authoring Books and Technical Documents with R Markdown*. ISBN 978-1138700109. Boca Raton, Florida: Chapman and Hall/CRC. https://github.com/rstudio/bookdown.

Zhu, H (2019). *kableExtra: Construct Complex Table with 'kable' and Pipe Syntax*. R package version 1.1.0. https://CRAN.R-project.org/package=kableExtra.