Technical Assistance – Market Studies of Pipeline and Stakeholders

Germany

July 2025

Disclaimer

This project benefits from support from the European Union under the InvestEU Advisory Hub. Its production was commissioned by the Council of Europe Development Bank (CEB) from Price Waterhouse Coopers (PWC).

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An **comprehensive analysis of social infrastructure investment** in EU countries is a key objective of the project

Introduction – Project in focus

The project is initiated by the **Council of Europe Development Bank** who has hired **PricewaterhouseCoopers**, through the support of InvestEU Advisory hub, to identify market gaps and potential investment opportunities, with stakeholder engagement playing a crucial role in enriching the study's findings.

Project overview and goals

- The project, led by the **Council of Europe Development Bank (CEB)** and executed by **PricewaterhouseCoopers (PwC)**, is financed by the **European Commission under the InvestEU Advisory Hub**. This signifies a strong commitment from the EU to enhance social infrastructure.
- The aim is to **map the current state of social infrastructure investments** in several EU countries, notably including Germany. This involves a comprehensive assessment of market conditions, funding availability, and potential investment opportunities.
- **The study aligns with InvestEU's broader goals to stimulate investment across the EU**, specifically targeting the development and enhancement of social infrastructure.

Methodology and phased approach

1. **Phase One - Desk Research**: In the initial phase, PwC conducts extensive desk research to collate and analyse existing market data and studies. This phase establishes a foundational understanding of the investment landscape in the targeted countries and identifies key stakeholders.
2. **Phase Two - Direct Market Interviews**: Following the desk research, the second phase involves conducting interviews to gather first hand market insights from identified stakeholders. This step is crucial to enrich the analysis with real-world perspectives and data.
3. **Comprehensive Evaluation**: The combination of desk research and direct interviews ensures a thorough and multi-dimensional analysis, providing a detailed picture of the current market and identifying key areas for potential investment.

Stakeholder engagement

- **The CEB and PwC are actively engaging with principal stakeholders to gather insights and respond to specific inquiries**. This collaborative approach validates the study's findings and enriching the analysis with diverse perspectives.
- Through this engagement, the **CEB seeks to build a network of informed and interested parties**, fostering a collaborative environment for future projects and investments.
- The aim of this presentation is to present the situation and the market insights, and not to discuss clear solutions.
- Post-study, stakeholders will have opportunities to remain involved in ongoing dialogues and initiatives led by the CEB. This is aimed at translating the study's findings into tangible investment actions and partnerships.

Limitations

The main project limitations consisted of reduced data availability, which was mitigated through involvement of local experts who provided estimates, and in some cases, additional data access. As well as, access to stakeholders for the phase 2 interviews, which resulted in some segments being covered by a limited number of interviews.

1

Introduction

As Germany is facing a recession a large proportion of public infrastructure expenditure will be needed for a swift recovery

Introduction (1/3) – Overview of the Germany’s Economy

Germany‘s economic forecast

Since early 2022, Germany has been experiencing an economic downturn, particularly in its manufacturing sector. The Deutsche Bundesbank attributes this mainly to the loss of cheap Russian energy following the invasion of Ukraine, a decline in demand from its key export market, China, and reduced consumer confidence within Germany itself.

However, according to the IMF, these latter factors have proven to be only temporary. More concerning is Germany's stagnant productivity growth, which appears ingrained due to a lack of strong reforms and insufficient public infrastructure investment. Although Germany reported an average year-on-year GDP growth of around 5,7% between 2020 and 2024, European Commission projections indicate that the German economy is expected to stagnate in 2025, with forecasted growth of 0%. However, a modest rebound is anticipated in 2026, when GDP growth is projected to improve to 1,1%.

The slowdown in Germany’s economy is primarily attributed to increased tariffs, which are projected to weigh on consumption, investment, and exports in the near future. Rising global uncertainty is also contributing to the subdued outlook. Additionally, Germany has experienced a significant loss of market share in exports to both China and the US.

Germany	2020	2021	2022	2023	2024	CAGR
Population (mil.)	83,17	83,16	83,24	83,12	84,46	0,9%
GDP, current prices; bn., EUR)	3.450	3.676	3.954	4.186	4.305	5,7%
GDP growth (%)	n/a	6,6%	7,5%	5,9%	2,9%	n/a
Real GDP per capita (EUR)	41.480	42.990	43.260	42.780	42.580	0,7%
Unemployment (%)	3,7%	3,7%	3,2%	3,1%	3,4%	n/a
HICP (rate of change)	0,4%	3,2%	8,7%	6,0%	2,5%	n/a

Real GDP per capita and inflation

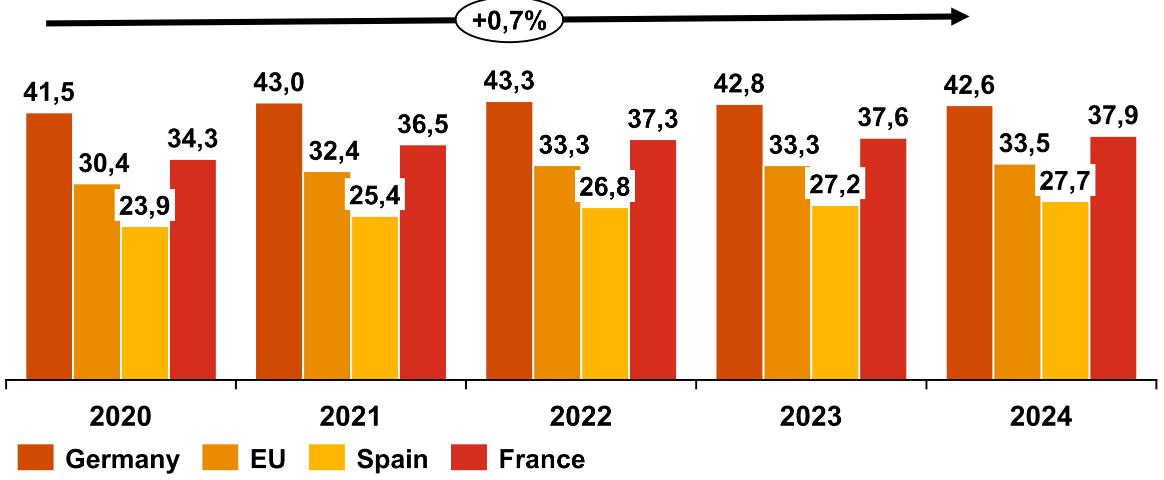
Over the past five years, Germany‘s real GDP per capita fluctuated. The COVID-19 pandemic led to a drop from 43,3k EUR in 2019 to 41,5k EUR in 2020, a 4,2% decrease.

The economy showed recovery signs in 2021 and 2022, with real GDP per capita rising to 43,0k EUR and then 43,3k EUR, respectively. However, in 2023, it fell by 1,1% to 42,8k EUR, below the 2019 level, due to the ongoing recession.

From 2020 to 2024, Germany‘s real GDP per capita saw an average annual increase of 0,7%,. But when observing the time period from 2019 to 2024 an average y-o-y decrease of -0,3% was observed.

Due to the energy crisis and geopolitical factors, Germany's inflation surged to 8,7% in 2022. However, recent indications from the Bundesbank show a gradual moderation in inflation; however, it remains above both pre-pandemic levels and the EU's target inflation rate.

Real GDP per capita of Germany and a basket of countries; in EUR; in ths.

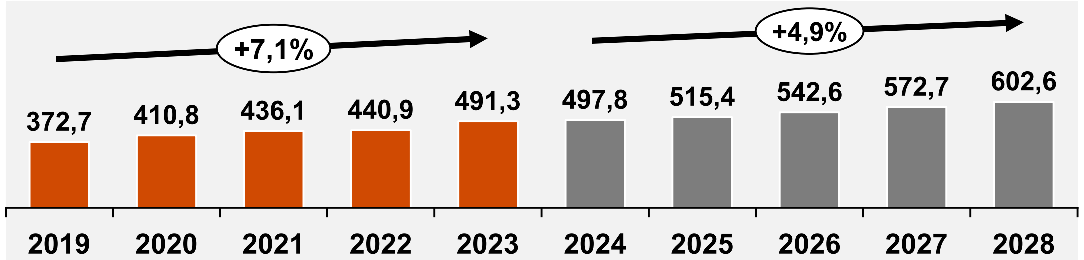


Sources: Eurostat, European Commission, IMF, Deutsche Bundesbank, PwC analysis

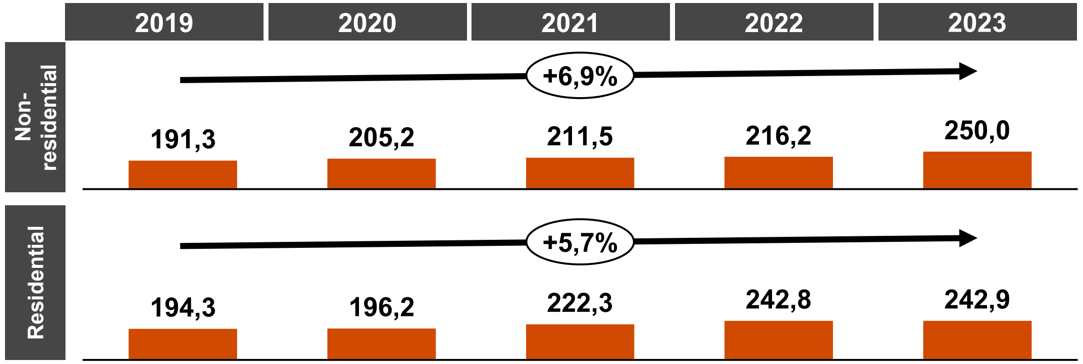
Despite the German construction sector‘s resilience, trends in residential building suggest a gap in planning and investment

Introduction (2/3) – Overview of the Construction Sector

Buildings construction industry value; in EUR; in bn.



Construction industry value by category segmentation; EUR; in bn.



Construction industry share by category segment; in 2019; in 2023

Expectations for 2024 are negative, particularly pronounced in residential sector

The German construction industry experienced a healthy growth year-over-year with a CAGR of 7,1% between 2019 and 2023. In 2023, the industry recorded the strongest growth, recording an increase of around 11,4% from a year prior. Additionally, the German construction industry has demonstrated a high level of resilience and robustness as the sector has not recorded a contraction in construction sector value during the COVID-19 pandemic.

According to the projections, the industry is expected to see healthy y-o-y growth of ~4,9% over the forecast period from 2024 to 2028, however, this projection suggests a slowdown in construction industry growth compared to the prior observed period. This is mainly due to many investors holding back on their investment plan because of the weak economy with no projected momentum.

In 2023, the construction sector in Germany accounted for around 15,8% of the total construction sector value in Europe, amounting to approximately 491,3B EUR in total revenues.

The construction industry in Germany is mainly fragmented in the residential segment, while a few large players dominate in the non-residential segment. The market is dominated by large incumbents (HOCHTIEF, Vonovia, Bauer and STRABAG) with a large international presence.

Non-residential and residential construction

The non-residential segment accounted for the sector‘s largest proportion in 2023, with total revenues amounting to ~250B EUR (50,9% of the industry‘s overall value). Between 2019 and 2023, the sector recorded a substantial y-o-y growth rate of ~6,9%. Interestingly, the proportion of non-residential construction value has decreased by 0,4 percentage points in 2023 compared to 2019.

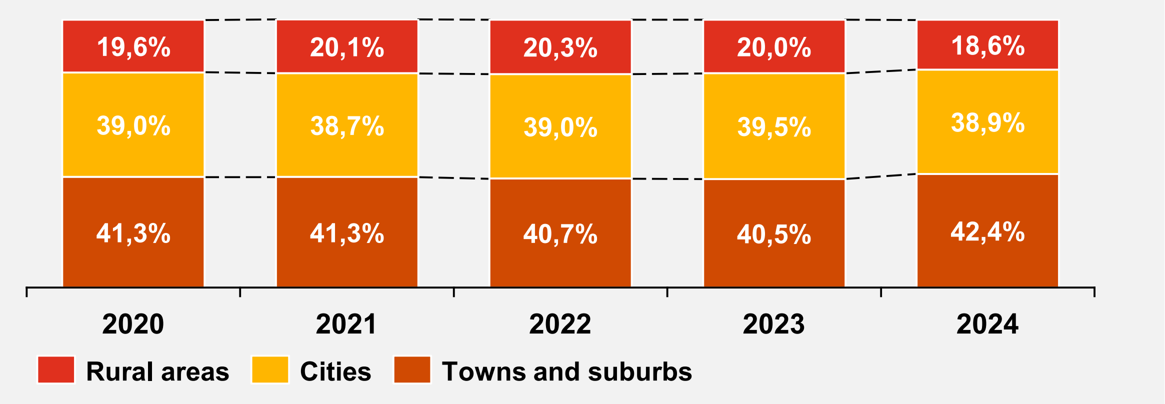
The residential construction accounted for around 49,1% of the total construction sector value, amounting to ~242,9B EUR in 2023. Between 2019 and 2023, the residential construction sector recorded a y-o-y growth of ~5,7%. However, according to the European Construction Industry Federation (FIEC), in 2023, building construction in Germany fell by 11,4%, driven by a ~20% decline in orders for residential construction.

Sources: Eurostat, EMIS, European Construction Industry Federation (FIEC), PwC analysis

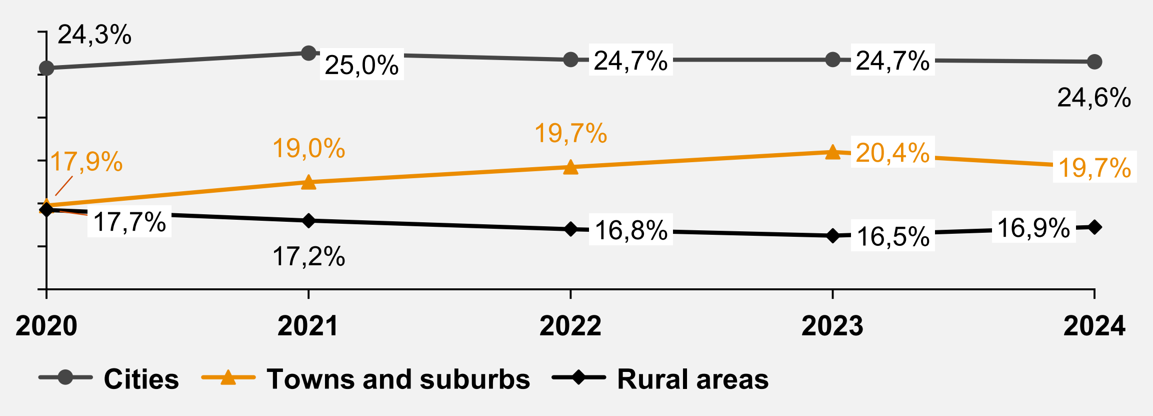
Almost one in five Germans residing in cities are at risk of poverty or social exclusion, significantly above the EU average

Introduction (3/3) – Overview of Germany‘s population

Share of population by degree of urbanisation; in %



People at risk of poverty or social exclusion by degree of urbanisation; in %

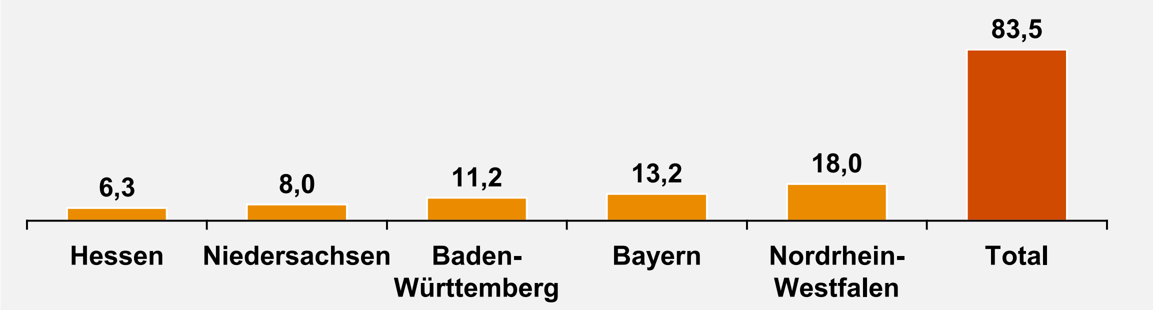


In 2024, Germany‘s population reached approximately 83,5M, with projections suggesting it will rise to around 85,3M by 2030. Most Germans reside in towns and suburbs (42,2%), followed by those residing in cities (38,9%) and rural areas (18,6%). Notably, the largest decrease over the past five years was observed in the rural population, which declined by 1 percentage point. In contrast towns and suburbs experienced a 1,1 percentage point increase, while cities remained virtually unchanged, with only a 0,1 percentage point decrease. This trend indicated a gradual shift towards urbanization, which has implications for urban planning and infrastructure development.

Germany comprises 16 federal states, or Länder. The largest share of the population resides in Nordrhein-Westfalen, with approximately 18,0M people or 21,6% of the national population. This is followed by Bayern, the largest state by land area, with about 13,2M people or 15,8% of the total population, and Baden-Württemberg, accounting for 13,5%. Berlin, the capital, has around 3,6M residents, ranking 9th among the federal states by population.

Germany reported a lower share of people at risk of poverty in towns and suburbs (19,7%) and in rural areas (16,9%) compared to the EU averages (20,3% and 21,3%, respectively). However, the risk of poverty in cities is relatively high at 24,6% compared to the EU average of 21,4%.

Population by the most populated Federal States in Germany; in m.; in 2024



Sources: Eurostat, Government of Germany, PwC analysis

2

Affordable social housing

This segment shows potential driven by **the housing shortage and rising demand driven by immigration**

Social and affordable housing

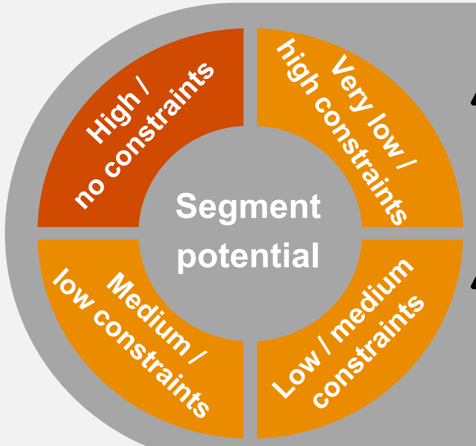
Key conclusions – Phase 1

- Social housing in Germany is defined as either the subsidised rental housing or housing provided at below-market rents.
- About 30% of population could be considered as cost overburdened on the national level, however large regional differences exist, and these figures are even greater in big population centres such as Berlin or Munich.
- Supply of social housing (both public and cooperative) has almost halved since 2006, mainly due to sales of housing stock, and subsequent lower investment.
- Germany has a low general apartment availability, with national average being 2,5% vacancy rate, with some cities like Berlin having 0,3%.

Key conclusions – Phase 2

- Germany's post-war social housing model, driven by private companies and long-term loans, was effective. However, reduced investment over time has led to a growing infrastructure deficit, now requiring sustained reinvestment.
- Germany's housing challenges are most acute in metropolitan areas, further worsened by land scarcity and construction and labour costs increases.
- According to stakeholders, Germany has built fewer than 200k housing units annually since 2011, well below the estimated 350k - 400k needed.
- Achieving climate neutrality in Germany's housing stock by 2045 is projected to cost around 5T EUR, presenting a major market opportunity for IFI funding.

PwC Assessment

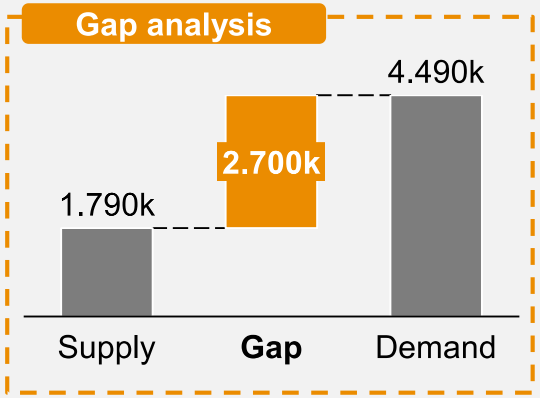


Germany's housing market is plagued by low availability of apartments, and worsening affordability, while the demand is growing due to an increasing population

Demand is growing due to an increasing population that can be mainly attributed to large immigration. This leads to a high gap and a high potential for IFI investments

Key Segment Data

- **4,1%** of stock - social housing
- **47,4%** share of home ownership
- **23,2%** mortgaged housing
- **5,9%** rented at reduced price/free
- **-32%** OC rate vs. EU average
- **30%** of population is cost overburdened



Social housing in Germany differs significantly from other systems, and is provided either through the state or cooperative model

Social Housing – General Overview (1/2)

Social Housing definition and organisation

In Germany Social housing is defined as subsidised rental housing provided at below-market rents, it is awarded to tenants who qualify for entitlement according to eligibility criteria.

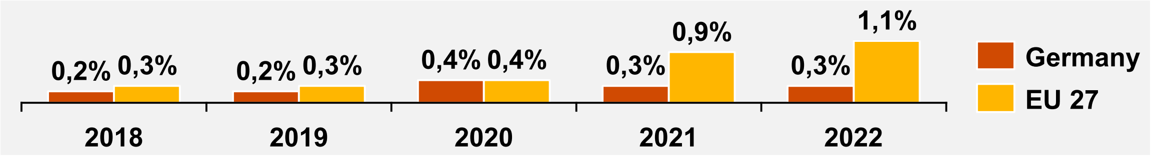
The organisation of the social housing is performed by The Federal Ministry for Housing, Urban Development and Building, who sets up the policy level, and determines the Federal budgets for housing. The federal states (Lander) are in charge of transferring this policy to the state level, and often supplement the federal budget with own funds. The municipalities s are in charge of provision of housing, either from own stock or stock sourced from private developers.

Germany differs significantly from other Social and Affordable Housing systems in a way that the provision of housing is not necessarily sourced from public buildings. Rather, the Government (mostly state or municipal level) can give subsidies for private developers to construct buildings, which will be used as social and affordable housing, or in other words rented at below-market rates. Hence the system aims to match the demand for housing through a mixture housing provided by various players, while providing private sector with the necessary incentives to enter the affordable housing market.

Another point of difference to other systems is the fact that this housing is not permanent in nature, rather according to the **Housing Promotion Act** (2001 "Wohnraumförderungsgesetz, WoFG") the housing is awarded on the period of 15-35 years (varies across states). After the expiry of this period the housing can be sold or rented at the market rates. This right is given to both private and public stock, and we have identified several examples of municipalities selling the stock to private investors to fund new projects.

This has also influenced the relatively low expenditure on housing development (significantly below EU average), shown on the figure up right, as only a portion of the stock has been developed using public funds, rather the Government provides subsidies in form of lower interest loans, subsidised land cost, or similar to the companies who develop housing.

General Government expenditure on housing development; in % of total



Provision of Social Housing

The organisation of the segment stems from the WWII reconstruction efforts, which focused on providing subsidies rather than construction of own stock. This has been selected to increase fiscal viability of these projects, as the state does not invest large sums of money, and inherit repetitiveness as the subsidies are returned in from of sold housing, hence funding other public projects.

However the challenges of uncertainty of temporary nature of housing has led to housing being provided in two distinct systems:

State led system

States provide subsidies (mostly in form of loans by KfW) to both Public Housing Companies (PHC) and private developers to construct and operate housing. PHC operate the constructed stock and rent it to individuals at reduced rates. After the period of between 15-35 years the stock is "liberalised" to be used at will.

Housing cooperatives

Housing cooperatives are member-owned players who construct dwellings, which are rented to the members at reduced prices. The members are not granted ownership of individual buildings, but rather a lifetime occupancy rights to specific unit. This model is more permanent in nature, as there is no time limit on affordability commitments. The entities are non-profit in nature and all excess revenue has to be allocated to future projects, with also any sale of stock requiring supermajority vote.

Sources: Eurostat, Government of Germany, Germany Real Estate Finance (REFIRE), Housing Europe, PwC analysis

While Germany has one of the highest tenancy rates in the EU, with low share of below-market rents

Social Housing – General Overview (2/2)

Tenure Breakdown

In 2023, Germany's homeownership rate stood at approximately 47,6%, significantly lower compared to the EU-27 average of about 69,2%, making Germany the biggest rental residential real estate market in Europe. The homeownership is split equally between those burdened by mortgage or loan, and those owned outright.

The majority (~88%) of rented dwellings are rented at the market price, with the share of renters below market rate represents only 5,9% of all dwellings in Germany. This puts Germany at the bottom half of the EU countries in terms of sub-market rate dwellings, and is significantly below the EU average of 10,2%. This suggests a relative low supply of affordable housing in Germany, especially compared to other EU countries.

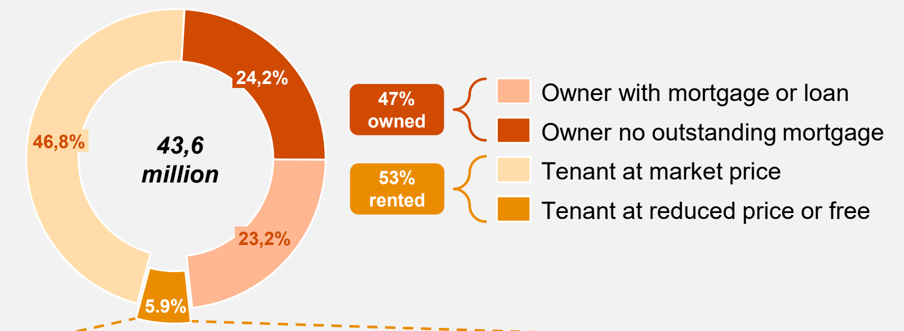
Furthermore, we see a significant yearly change in this metric, where the percentage was more than double the current rate in year 2005. This is attributed to the temporary nature of housing support discussed in the previous slide. Research suggests that in early 2020s a large degree of older stock build before 1990s has been sold to private market as their affordability commitments have expired. We see a recovery in recent years, as new housing is entering this market, mainly driven by Government's policy of investing in housing, however the figures are still significantly lower than expected.

Housing eligibility

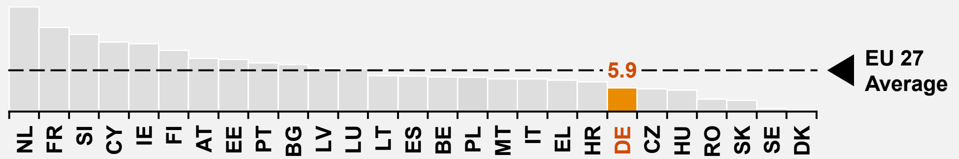
WoFG act determines the eligibility for state subsidised Social Housing. The applicant have to receive a housing entitlement certificate ("Wohnberechtigungsschein, WBS"), which is dependent mainly on their income levels, as well as the ability to reside in Germany (residency permit or ID card). The levels vary according to the number of household members, and the regional costs of living. For example, in 2023 the yearly income limits for single person household were 16,8k - 20k EUR, while for two-person household it were 25,2k – 30k EUR.

The size of the apartment was determined based on the size of the household, and the allocation of apartments was prioritised to special groups (e.g. single parents, elderly individuals, people with disabilities). It should also be noted that immigrants with the right to reside in Germany also qualified for this type of support.

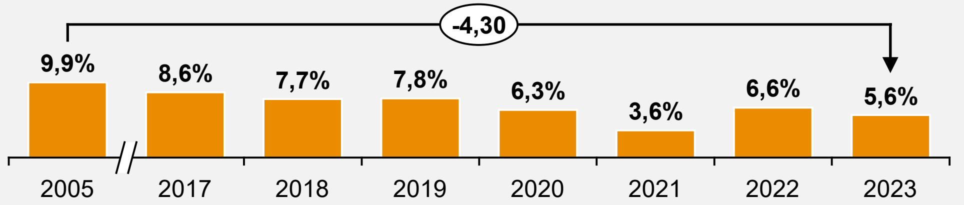
Total number of dwellings; in 2023



Share of tenants, rent with reduced prices or for free in Europe in 2022



Share of tenants who rent with reduced prices or free in Germany



Sources: Eurostat, Government of Germany, German Real Estate Finance (REFIRE), German Economic Institute, PwC analysis

Cost of living increases, along with housing affordability issue drive overcrowding in Germany potentially increasing demand of SH

Social Housing – Key Drivers (1/2)

Overcrowding rate is increasing across the observed period

Germany has lower overcrowding rate as compared to the EU average, however while the EU average has reduced slightly in the last five years, German overcrowding rate has been increasing in the same period by a CAGR of 10%, resulting in a 46,2% increase or 3,6 pp increase. Overcrowding occurs when number of occupants in a dwelling exceeds EU defined figures, which can happen due to young adults not moving out and staying with parents, or elderly moving back to live with their siblings. In both cases the main reason is affordability of housing.

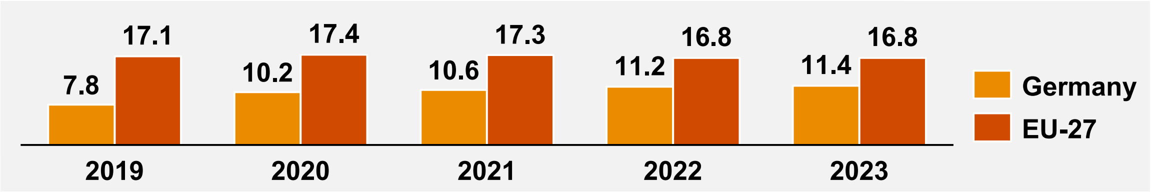
Taking a look at affordability we see a significant, though lower than EU average, rent price increase in Germany, which grew by 15,9% (16,8% EU average) as compared to the prices in 2015. On the other hand, this increase in rental costs is still below general HCIP in Germany, which stands at 29%. This would indicate that housing costs increase are not the primary cause for reduction in affordability of housing, however a generally higher costs of living attribute more towards the trend of overcrowding.

On the other hand, we see a positive change in housing cost overburden in Germany between the years of 2015 and 2024. The cost overburden at the first income quintile has dropped by 12,3pp, a much more significant drop than the EU average. That being said, we can also notice an increase in cost overburden in third and fourth quintiles, indicating that affordability is slowly becoming an issue at the larger income levels as well.

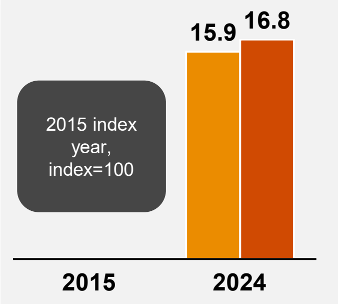
When taking into account the general drop in below-market-rate rentals quoted on the previous slide, we can identify a clear need for social and affordable housing in Germany, which is influenced by worsening affordability and cost of living, and is influencing overcrowding in Germany.

The following is recognised by the Government, who has introduced specific programmes quoted to the right to tackle this issue through increased funding. However, research suggests the targets are not yet reached with 2023 figures completing only 50% of 100k new units produced.

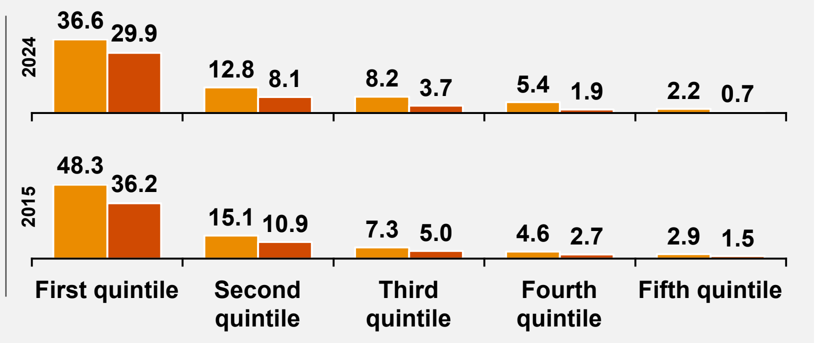
General overcrowding rate; in %



Rent price change index



Housing cost overburden according to income quintile



Social Housing Promotion
Since 2020, the Federal Government has introduced several measures to promote social housing, with the budget increasing each year, reaching a historic high of 3,5B EUR annually from 2025 onwards. Through the "Social Housing Construction 2024“ programme – an agreement between the federal and state governments – 2,7B EUR was allocated for social housing in 2024.

Social Housing Alliance
In response to the pressing need for social housing, the Social Housing Alliance, comprising tenant associations, trade unions and industry groups has been advocating for substantial change in housing policy. The coalition has called for the implementation of a special fund amounting to 50B EUR in order to bolster social housing construction, aiming to meet the Government‘s target of 100k new units annually.

Sources: Eurostat, Government of Germany, Bundesbank, Global Property Guide, Local news outlets, PwC analysis

Research suggests low housing vacancy rate as one of the key issues in Germany, further putting pressure on affordable segment

Social Housing – Key Drivers (2/2)

Immigration drives population growth, influencing demand for affordable housing

Germany has experienced a modest growth of population in CAGR and percentile terms, with population growing by 1,54% on a annual CAGR rate of 0,2%. However, in absolute terms, this population growth means additional 1,3 million people living in Germany. Considering the affordability and overcrowding issues identified on previous slide, this trend has also contributed to the overall issue of affordability of housing in Germany.

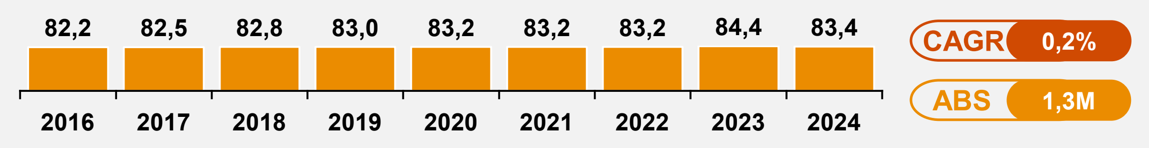
Furthermore, the main driver of the mentioned population growth has been immigration of non-German residents, who have grown by CAGR of 11,9% annually and 914,k in absolute terms. This represents 70% of the recorded population growth. This figure excludes migrants who move seeking asylum, as these have dedicated policies for housing. It should be noted that reports do outline this as a key issue, as this additional need for housing is putting pressure on the state and municipal budgets, diverting funds away from Social and Affordable housing, however we do not go into details in this report on this issue.

Growing migrant population places additional strain on German housing market, as migrants are in direct need of housing immediately, while organic population growth is indicative of future demand, as a) not all families with newborns require new housing, and b) the new population needs to grow into the right age group to seek housing.

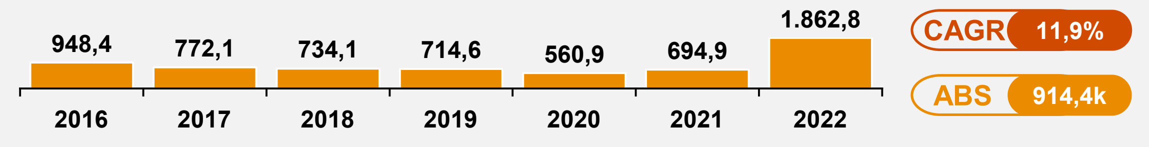
When looking at the housing market we see a general trend of low availability, as showcased on the map to the right. As suggested by CBRE-empirica report from 2023 based on the data from 2022 census, we see overall 2,5% vacancy rate of housing in Germany. This situation is even more pressing when we examine the data on a regional level where larger cities like Berlin and Hamburg post vacancy rates of 0,3% and 0,4% respectively, while Bavaria has vacancy rate of only 1,1%. Overall, all but three states post vacancy rates below 5%, which is significantly lower than that observed in peer countries such as France, Spain or Italy, where research would not indicate this being a major issue.

This coupled with issues of affordability and growing overcrowding indicates large need for affordable and housing segments.

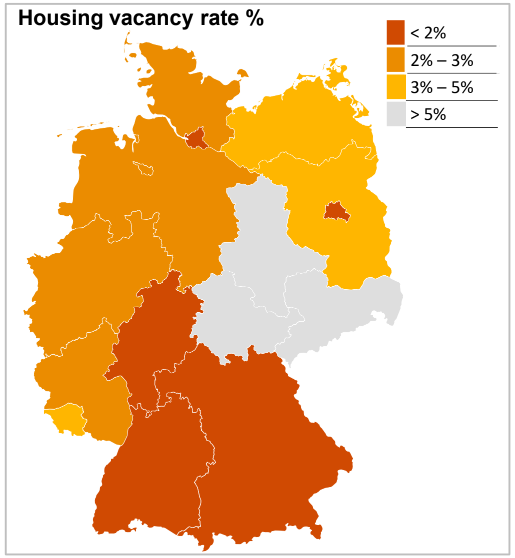
Population of Germany in millions



Immigration of non-German citizens in thousands



Housing vacancy rate, 2022



Federal State	Vacancy Rate
Germany	***2,5%***
Berlin	0,3
Hamburg	0,4
Bavaria	1,1
Baden-Württemberg	1,1
Hesse	1,5
Schleswig-Holstein	2,2
Bremen	2,5
North Rhine-Westphalia	2,7
Rhineland-Palatinate	2,7
Lower Saxony	2,9
Saarland	4,1
Brandenburg	4,2
Mecklenburg-Western Pomerania	4,4
Thuringia	5,8
Saxony	6,1
Saxony-Anhalt	7,7

Sources: Eurostat, Government of Germany, Bundesbank, Global Property Guide, Local news outlets, PwC analysis

Bottom three deciles are considered cost overburdened, and represent total market size for Social and Affordable housing

Social Housing – Market Demand

Germany's population shows a strong inclination towards renting a dwelling

As mentioned on the previous slides affordability and availability of housing are one of the key drivers of demand for Social and Affordable housing in Germany. Calculation below deals with understanding the scope of total market potential for social housing in Germany.

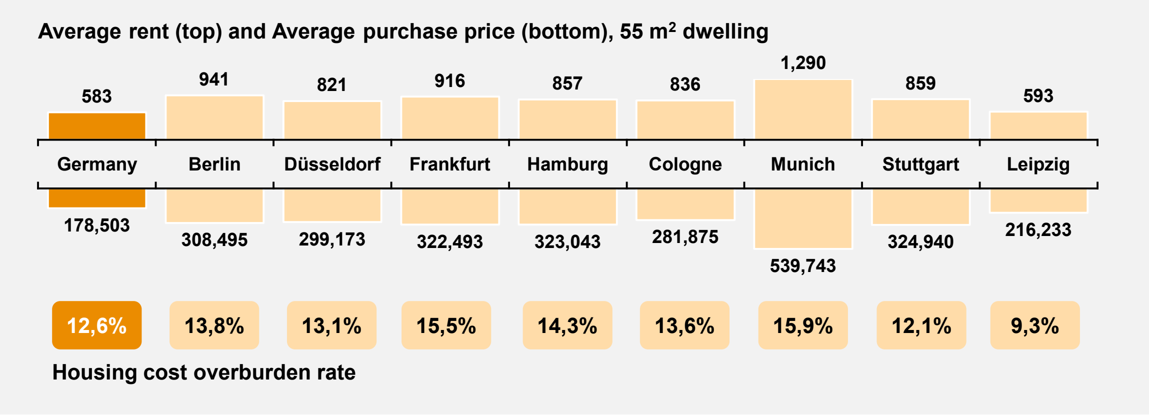
What also needs to be taken into account is the regional disparity within Germany, which is portrayed on the chart to the right. Essentially, we see large differences in both average rents as well as average purchase prices between Germany as a country, and largest cities. On average we see 1,52x higher rents in major cities than Germany as a whole. On the purchase side we see 1,83x higher prices than Germany as a whole. This would indicate that in these cities the potential total market for Social and Affordable housing would be larger than that presented below, however a more granular data is needed to confirm this.

To calculate the potential market size we need to understand the ability of German citizens to either rent or buy property. For this reason, as shown in the table to the left, we have taken average total income per householder expressed in deciles, and calculated the 40% of the HH income. This percentage is a threshold where a household would be considered cost overburdened.

To this calculation we have added the data on average rents and average cost to purchase. In Germany, according to market reports from major property brokers, average rental of the 55 m^2 apartment was 583 EUR per month. This means that bottom two deciles would be considered cost overburden. According to same brokers, the average cost of dwelling in a multi-dwelling building was 3.245 EUR per m^2. Meaning that the 55 m^2 dwelling would cost around 178k. After a 20% down-payment, required by the bank's commercial terms, the loan amounts to 142,8k EUR, resulting in a monthly instalment of between 670 and 690 EUR. This means that the bottom three deciles would be considered cost overburden.

Considering the calculations above we can assume that all households, which are considered cost overburden would be a potential candidate for social housing, hence we will account for total market size of 30% of households in calculating the gaps for future slides.

Overview of prices in largest German cities



Average total income per household; in deciles; 2022

Decile	EUR	40% HH income, EUR	Rent cost overburden	Purchase cost overburden
D 1	1.176,5	353		
D 2	1.836,9	551,1		
D 3	2.406,2	721,9		
D 4	2.790,9	837,3		
D 5	3.209,9	963		
D 6	3.655,2	1.096,6		
D 7	4.285,2	1.285,6		
D 8	4.992,8	1.497,8		
D 9	6.071,5	1.821,6		
D 10	9.694,0	2.908,2		

Sources: EUROMOD 2023, Eurostat, Government of Germany, Deutsche Bank, Bundesbank, PwC Analysis

Germany’s supply is characterised with reducing social and affordable housing stock and missed construction targets

Social Housing – Market Supply

Germany‘s social and affordable housing stock is reducing

In 2023, Germany's housing stock comprised 43,7M dwellings, with approximately 1,8M units dedicated to social housing. Out of this figure around 1,1M dwellings are managed by public housing, accounting for around 2,5% of the national housing stock, while 717k is managed by housing cooperatives, accounting for 1,64% of the stock.

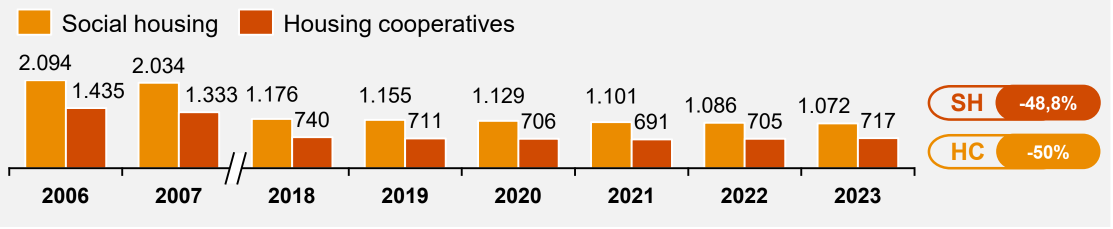
Both follow the similar trends of reduction of their stock in the past years, with -48,8% of social housing and -50% of housing cooperatives. However, it should be noted that in past two years housing cooperatives have increased their supply. In case of social housing this decline is primarily due already mentioned temporary nature of public housing, and the ability of local Governments to sell of social housing after affordability commitments have expired. On the other hand, the union for housing cooperatives is stating that the reductions in stock have been mostly due to sale of dwellings to municipal companies, which are permanently offered at an affordable rates.

In regard to the regional segmentation in Germany, the majority of social housing supply is held in North Rhine-Westphalia region with around 607k units (or ~34% of the total supply), followed by Bavaria (261k units) and Berlin (184k units). On the other hand the federal states of Saarland and Mecklenburg – West Pomerania have smallest number of units.

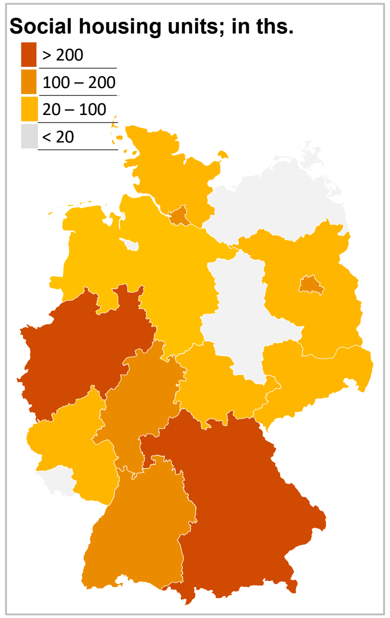
It is not the case that the supply follows the population figures in Germany, as the national average supply per 1.000 inhabitants is 21,4, and largest states are all below this figure (Rheinland-Palatinate at 2,97 and Bavaria at 19,8). On the other hand, smaller population states are also below national average (Thuringia at 12,4 and Saxony at 6,8). Hence we can conclude that the supply is not correlated to population, and is obviously a specific decision of the federal state.

Moreover, looking at the total supply of housing in Germany, the number of building permits has been decreasing y-o-y by around 7,9% between 2019 and 2023, this has also influenced the similar drop in construction of new buildings, indicating that the situation will not significantly improve in the near future. It should also be noted that the Government’s targets of 400k buildings constructed, and 100k social housing buildings constructed have been missed in past two years. This coupled with recession of German economy indicates that situation is unlikely to improve.

Social housing supply, in thousands.



Social housing (SH) and Housing cooperatives (HC) supply, 2023



Federal State	Total	SH	HC
Germany	**1.790.195**	**1.072.266**	**717.929**
North Rhine-Westphalia	607.079	426.775	180.304
Bavaria	260.685	134.793	125.892
Berlin	183.654	99.849	83.805
Hamburg	149.584	81.105	68.479
Hesse	147.506	82.369	65.137
Baden-Wuerttemberg	116.505	53.600	62.905
Lower Saxony	84.474	51.242	33.232
Schleswig-Holstein	68.442	46.701	21.741
Rhineland-Palatinate	53.606	36.420	17.186
Brandenburg	34.575	18.359	16.216
Thuringia	26.192	12.633	13.559
Saxony	22.432	13.083	9.349
Saxony-Anhalt	14.594	5.712	8.882
Bremen	11.006	6.447	4.559
Mecklenburg - W.Pomerania	8.422	2.443	5.979
Saarland	1.439	735	704

Sources: Eurostat, Government of Germany, Deutscher Bundestag, Pestle Institute, PwC Analysis

3

Student housing

A high growth of foreign students coupled with low growth of student housing is the main issue in this segment

Student housing

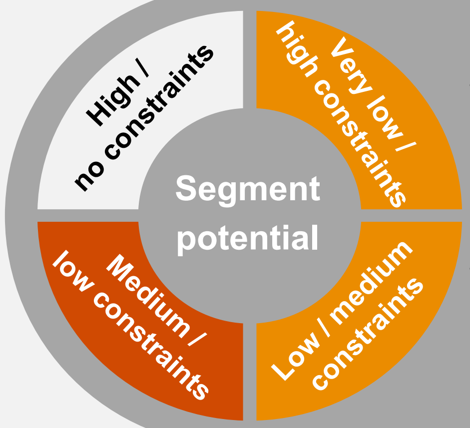
Key conclusions – Phase 1

- The majority of public student dormitories is managed by Student unions (Studierendenwerke).
- The number of tertiary education students has been growing steadily, with a CAGR of 1,6% between 2017 and 2022. During this period, a consistent rise in the number of foreign students (CAGR of 9,3%) has been observed.
- Since 2007, public-funded student residence halls have added 16,8k places, bringing the total to 240,7k in 2024.
- One of the main challenges of the segment is the mismatch in the growth of the number of students (68,5%) and the lacklustre growth of student housing places.

Key conclusions – Phase 2

- Increased demand for student housing is largely driven by the shortage of affordable housing, particularly in major university towns.
- Access to finance is constrained by state-imposed borrowing restrictions, with some local regulations further preventing Studentenwerk from taking out loans.
- Stakeholders revealed that the main issues include rigid funding structures, restrictions on borrowing, and bureaucratic delays that hinder the timely initiation and completion of developments.

PwC Assessment

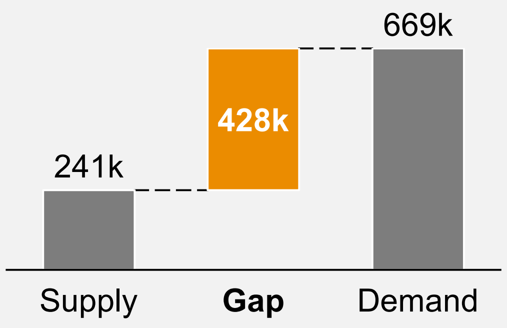


- The increasing number of domestic students and the rapid increase of foreign students contribute to the growing demand in the short and medium-term.
- Increasing the PBSA supply in Germany is relatively difficult due to the high acquisition prices for land, as well as the zoning and other regulatory challenges.

Key Segment Data

13% students living in dorms	**26%** student living with parents	**7,9k** number of PBSA under construction
403,4k number of foreign students	**9,3%** CAGR - foreign students	**240,7k** est. supply of beds

Gap analysis



Student unions are the main stakeholder in the segment, overseeing provisioning and maintenance of dormitories

Student Housing – General Overview

Student housing options

In Germany, students have a variety of housing options available. According to our research, only 26% live with their parents and ~13% of students live in designated student housing. The remainder (61%) live in shared or private rental apartments or in homestays.

Students that live in purpose-built student accommodation (PBSA), can choose between private and public providers.

		Estimated Cost
1	**Public student halls of residence (Studentenwohnheim)** which are usually the most affordable option and very popular among international students. The majority of dormitories in Germany are managed by local student unions (Studierendenwerk, SW).	110 - 830 EUR / mo
2	**Private student halls of residence** are private generally more expensive than public dormitories, however, they also include more amenities and a better quality of rooms. These dormitories are usually one of the most popular options for foreign students.	500 - 1000 EUR / mo

Students that choose not to live in PBSA, are either living at home or are renting flats or rooms from the private real estate market and are therefore affected by price increases.

3	**Private rentals** are private flats or houses rented by one or several students or young professionals. This option is usually relatively expensive, as the rents are rarely effectively regulated.	350 - 1300 EUR / mo

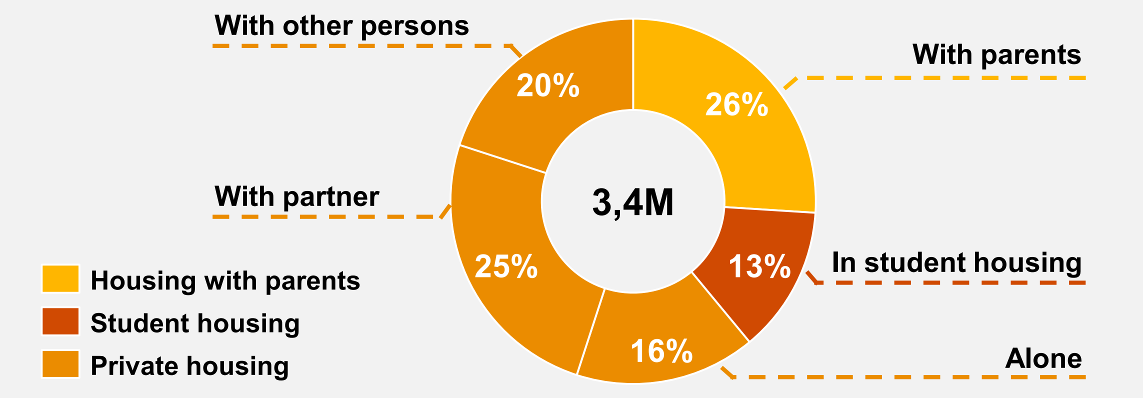
4 **Accommodation in a host family (Homestay)**

Another housing option is a host family, mainly popular among foreigners. International universities typically cooperate in finding a suitable host family for a student.

5 **Living at home and commuting**

Around 26% of students are living with their parents. Compared to other European countries averaging 34% of students at home, this places Germany below average.

Split of students per type of accommodation; in %



Student housing segment organisation

The majority of public student dormitories is managed by Student unions (SWs). They manage student room provisioning, construct new dorms, and own student housing. They also often construct and own student housing. They are financed by the rents that they collect, state and federal subsidies and by a mandatory annual student contribution. There are 57 local SWs governed by local and regional laws, with a national umbrella organisation (Deutsches Studierendenwerk), which provides policy recommendations, coordinates activities and ensures compliance with goals. SW can take up loans for specific purposes, which need to be approved by state authorities.

The universities are responsible for student admissions through their selected channels. In order to do so they are in contact with their corresponding SWs to align on applications and availability. Some Universities also own on-campus student accommodation, which they can allocate to their students directly.

The Federal Ministry of Housing, Urban Development, and Building (along with state governments and SWs) is responsible to develop policies, provide funding and coordinate on plans/goals with the involved stakeholders.

Sources: Eurostat, Eurostudent, Government of Germany, Deutsches Studierendenwerk (DSW), PwC analysis

The price pressure on the real estate market is impacting the financial situation of students in the country severely

Student Housing – Key Drivers

Price pressures on students are increasing

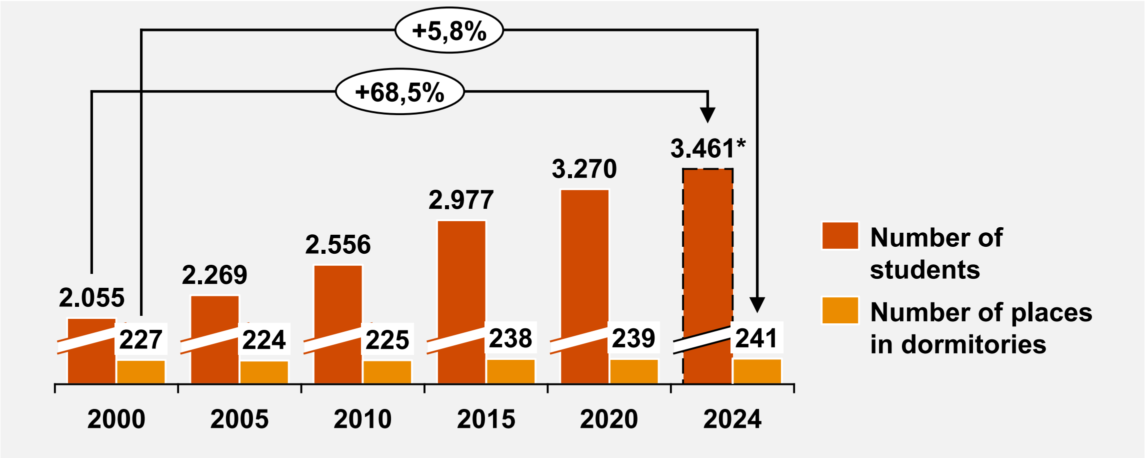
The growth in the number of students in Germany has not outpaced the growth in the number of student dormitory places. From 2000 until 2024 this difference was 62,7 p.p., which means that the number of students grew 11,8x faster than the number of places in student residences. Consequently, students were forced to find other forms of housing or live with their parents, as not enough places were available for the growing student population.

As there are not enough student housing places in dormitories, the private rental market is often the only option to find accommodation for students. Germany is the leading country in Europe in terms of the share of renters (52,4%), while this share has been increasing in recent years. The increasing number of renters has also impacted the price pressure on the market, which resulted in the growing rents on the private rental market (15,5% since 2015). The increased number of renters as well as the increased rents are significantly impacting the financial situation of the student population in Germany.

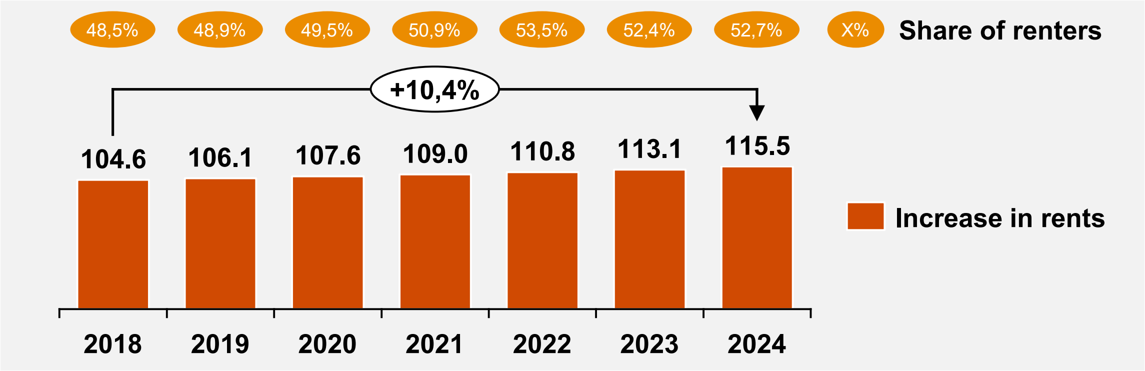
The increased financial pressure on students has resulted in an increased share of student living at the risk of poverty (37,9%). This share is even higher for students living alone or sharing accommodation with other students (76,1%), which is often the main reason why students take up a job while studying. In comparison, the risk of poverty for the general population in Germany is 15,8%.

The Government is implementing measures to help students, by providing a subsidy (app. EUR 380) for housing, that is aimed at the population with the lowest incomes. However, this subsidy is covering the total living costs of students only in 2 out of 38 University cities. The government is also implementing initiatives to stop the conversion of public dormitories into private real-estate or private dormitories, by implementing better zoning laws. These initiatives are especially important in the most expensive student cities like Berlin and Munich, where also a very high share of students live.

Number of students compared to number of dormitory places, in ths.



Rent index in Germany (2015=100) and share of renters



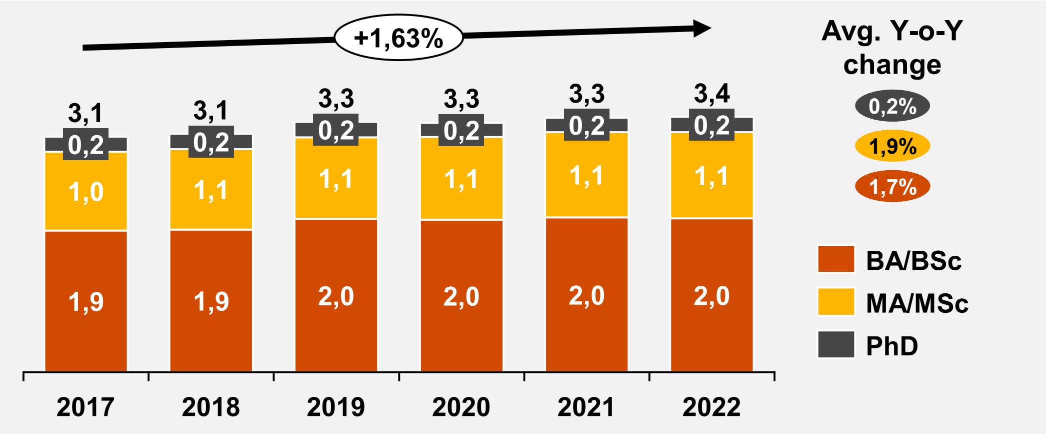
Sources: Government of Germany, German Academic Exchange Service (DAAD), PBSAs, Local news outlets, PwC analysis

*Estimation based on historic data, as 2024 data is not available on Eurostat yet

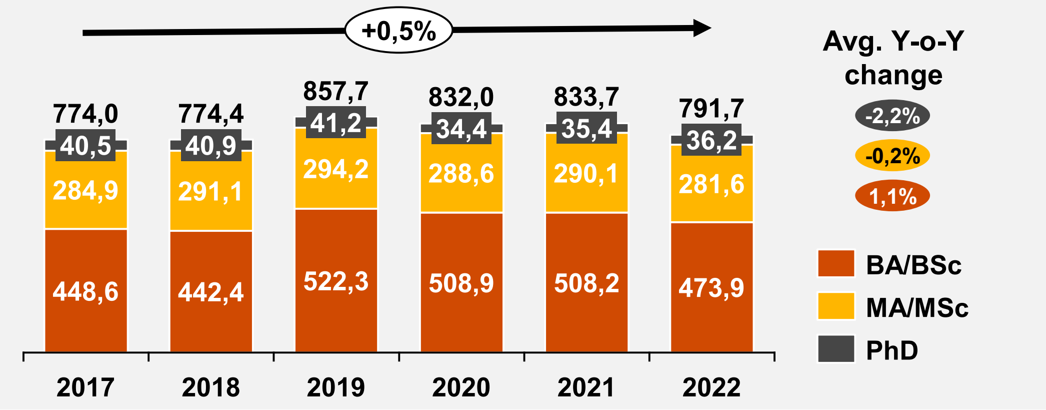
While student enrolment is on an upward trajectory, a recent decline in new enrolments has been observed after COVID

Student Housing – Market Demand

Number of tertiary education students; in mil.



Number of newly enrolled student per year, in ths.



Increasing total and new enrolments, mostly driven by bachelor students

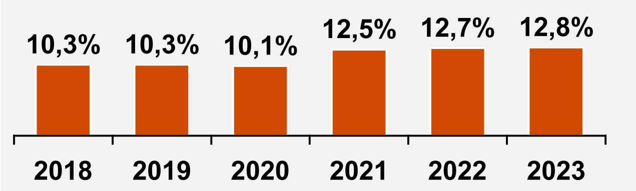
The total number of students in tertiary education has been increasing by 1,6% on a yearly basis over the period between 2017 and 2022. The increase is mostly due to an average 1,7% y-o-y increase of students that are studying for bachelor's degree and an average 1,9% y-o-y increase of master's students, amounting to a total of 259,9k more students in 2022, as compared to 2017.

The data indicates a slight upward trend in new student enrolment from 2017 onwards, but a decrease if analysing only the period from 2019 onwards. The latter is predominantly driven by an average 3,2% y-o-y decrease of bachelor degree students. The decline of newly enrolled students from 2019 onward is corresponding with other European countries and can be mostly attributed to the COVID-19 pandemic. In contrast to the general trend, private universities were able to notably increase their new enrolments, whereas public universities experienced a substantial decline in enrolments.

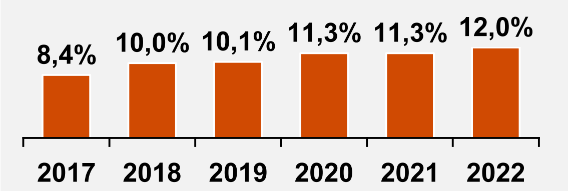
Germany has a particularly high dropout rate in tertiary education compared to the EU average of 9,5%, with 12,8% of students aged 18 to 24 years old leaving education early. The data reveals a steady increase in Germany's reported dropout rate from 10,3% in 2018 to 12,8% in 2023.

German academic institutions exhibited a pattern of steady growth in foreign student enrolments between 2017 and 2022, indicating a y-o-y growth of 9,3%. In the observed period, the number of foreign students has increased by 55,9%, totalling 144,6k more foreign students in Germany in 2022 compared to 2017. There were~403,4k foreign students in Germany in 2022, accounting for 12,0% of the total number of students, a share higher compared to the EU average (9,4%).

Number of early leavers aged 18-24; in %



Share of foreign students; in %



Sources: Eurostat, OECD, Government of Germany, PwC analysis

A stagnating student housing supply can be observed on the market, hence there is a need for strategic investments

Student Housing – Market Supply

Concentration of student housing supply in Germany's three largest states

In Germany, there are a total of 1,7k student residence halls with public financing support by the State. In 2024, the total supply of places in student dorms totalled 240,7k (+16,8k since 2001). Around 82,1% of student bed supply is operated by various Student Unions (SWs).

The majority of student accommodation is located in Baden-Württemberg, where around 46,7k places were available in 2024 or almost 20% of the total student bed supply in Germany. This is followed by Nordrhein-Westfalen with almost equal supply (46,4k or 19% of total stock). The top three Federal States hold more than half (~54,1%) of the student housing stock.

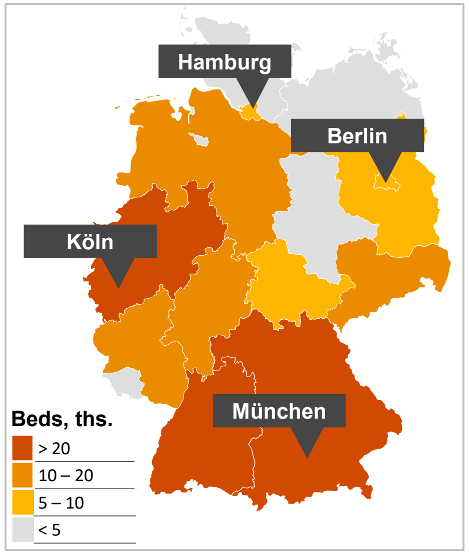
According to our estimations, Germany has an average availability rate of ~7,5%, meaning less than every tenth student could be accommodated in a student dorm. Notably, popular student Federal States such as Nordrhein-Westfalen (5,7%), Hessen (6,1%) and Berlin (4,2%) fall quite significantly below the average availability rate, potentially signalling insufficient supply in the respected regions.

Strategic investments and expansion pipeline observed

The student housing market has expanded in recent years with numerous new constructions and renovations observed across Germany. According to DSW, in 2024, there were a total of ~7,9k new student beds under construction. The most of new places in student residences were reportedly under construction in Bayern, totalling 2,3k beds (30%), followed by Nordrhein-Westfalen (1,8k new beds) and Hessen (+1,2k new beds). Notably, although a significant low availability rate in student beds has been observed in Berlin, the number of student beds under construction is negligible, potentially indicating a lack of government initiatives, which is mostly associated with expensive land acquisition costs.

The construction pipeline anticipates adding around 8,5k student housing beds, with the largest increase of about 2,2k beds expected in Bayern. However, regions like Nordrhein-Westfalen, Berlin, Thüringen, Hamburg, and others with a lower-than-average availability rates show little initiative to expand their student bed supply in the near future.

Student halls (H) and places (P) with the places / number of students (P/S); in 2024



Federal State	H	P	(P/S)
Germany	**1.737**	**240,7k**	**7,5%**
Baden-Württemberg (BW)	320	46,7k	11,6%
Nordrhein-Westfalen (NW)	384	46,4k	5,7%
Bayern	277	37,2k	8,4%
Niedersachsen	131	19,9k	9,3%
Hessen	160	17,8k	6,1%
Sachsen	83	16,1k	12,5%
Rheinland-Pfalz (RP)	75	11,8k	8,8%
Berlin	31	9,1k	4,2%
Thüringen	73	8,0k	6,0%
Brandenburg	48	6,9k	12,2%
Hamburg	36	5,7k	4,4%
Sachsen-Anhalt	42	4,7k	7,5%
Mecklenburg-Vorpommern	27	3,6k	8,5%
Schleswig-Holstein	28	3,5k	4,8%
Bremen	14	2,4k	6,1%
Saarland	8	1,0k	2,7%

Number of student beds under construction and in planning; 2024

Bayern +2.300

NW +1.829

Hessen +1.211

Sachsen +460

Bayern +2.248

BW +2.002

Hessen +789

RP +679

Sources: Government of Germany, Deutsches Studierendenwerk, PBSAs, PwC analysis

4

Universities

Despite the **high growth of foreign student**, Germanies **student to teacher levels are well below the EU average**

Universities

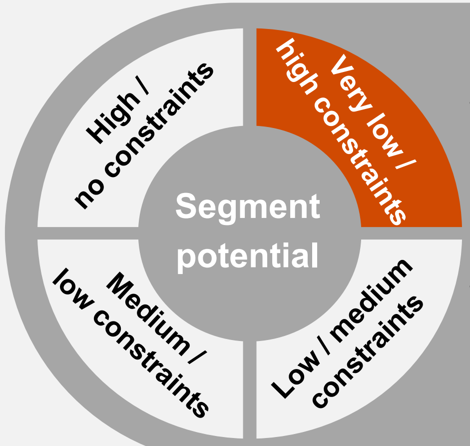
Key conclusions – Phase 1

- In 2022, around 83,2% of students or ~2,8M, were enrolled in public institutions, while 16,8% or about 564,6K students attended private institutions.
- In Germany, in 2022, there were 428 higher education institutions, including 109 universities, 245 Universities of applied sciences, and 74 colleges. The majority of HEIs in Germany (72%) are publicly owned.
- The number of tertiary education students in Germany has been increasing by 1,6% annually from 2017 to 2022.
- An improvement in the student-teacher ratio has been noted, with Germany achieving a ratio of 6,9, which is significantly below the optimal western EU average of 14,7.

Key conclusions – Phase 2 (Student housing & universities)

This segment has not been shortlisted for phase 2.

PwC Assessment



Large identified oversupply, due to the relatively low student-to-teacher ratio. Opportunities exist in financing private players or renovations of public HEIs.

Growing number of students, especially foreign students, indicate a stable and growing demand in the short to mid-term future.

Key Segment Data

2,8M students in public institutions

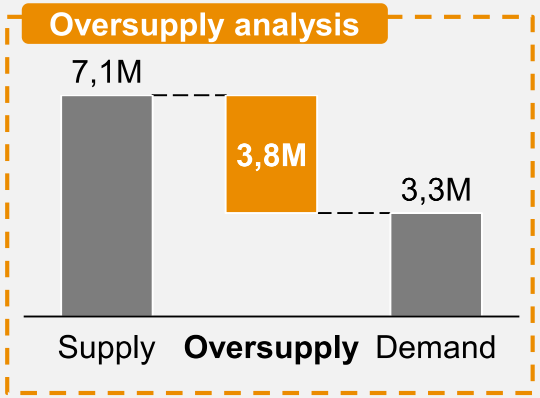
564,4k students in private institutions

428 number of HEI

9,3% CAGR - foreign students

1,6% CAGR – tertiary students

-2,6% CAGR - newly enrolled



Germany's universities segment is primarily governed by states and is well known for its high-quality institutions globally

Universities – General Overview

Organisation of tertiary education in Germany

The tertiary education system in encompasses 3 different education institutions, including academic universities, colleges (art and music, education, theology) and universities of applied sciences. Universities focus on academic and research-oriented education. Colleges prepare students for artistic professions, theology studies and teaching professions. Finally, universities of applied sciences emphasize practical, application-oriented learning with strong industry ties. These institutions, can be either state-run or privately owned.

The German education system follows the Bologna Process, which is a standard three-tier structure of bachelor's, master's and PhD degrees. This system ensures programs are compatible with the European Credit Transfer System (ECTS), allowing credits to be recognized across the EU in various fields of study.

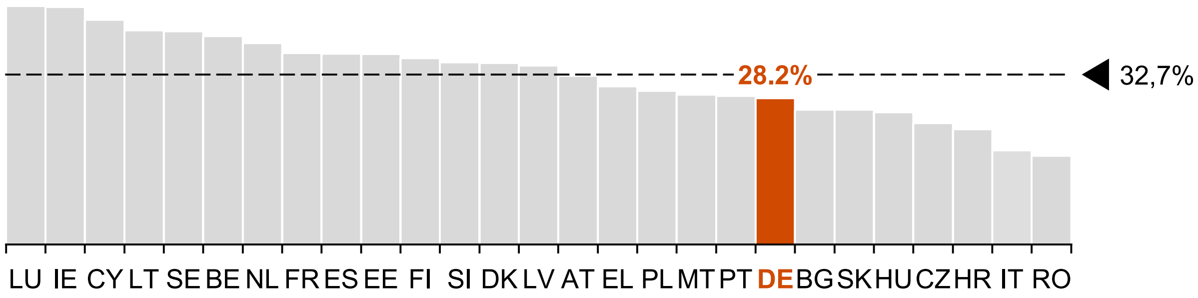
In Germany, responsibility for the higher education system is divided between the Federal Government of Germany and the Federal States. For the most part, higher education law falls within the legislative competence of the Federal States. As a rule, the regulations (The Higher Education Acts of the Länder) apply to all HEIs, including privately maintained establishments, and provide a systematic framework for the higher education sector. Moreover, universities are given a substantial level of autonomy to define their own policies.

Students in Germany are predominantly pursuing higher education in public institutions. In 2022, around 83,2% or 2,8M students attended public institutions, with the rest ~16,8% or 564,6k students attending private institutions.

Tertiary education at public universities in Germany is generally tuition-free, with nominal semester administration fees ranging between 100 – 300 EUR. Private universities, however, charge tuition fees varying from a few to tens of thousands of euros per semester.

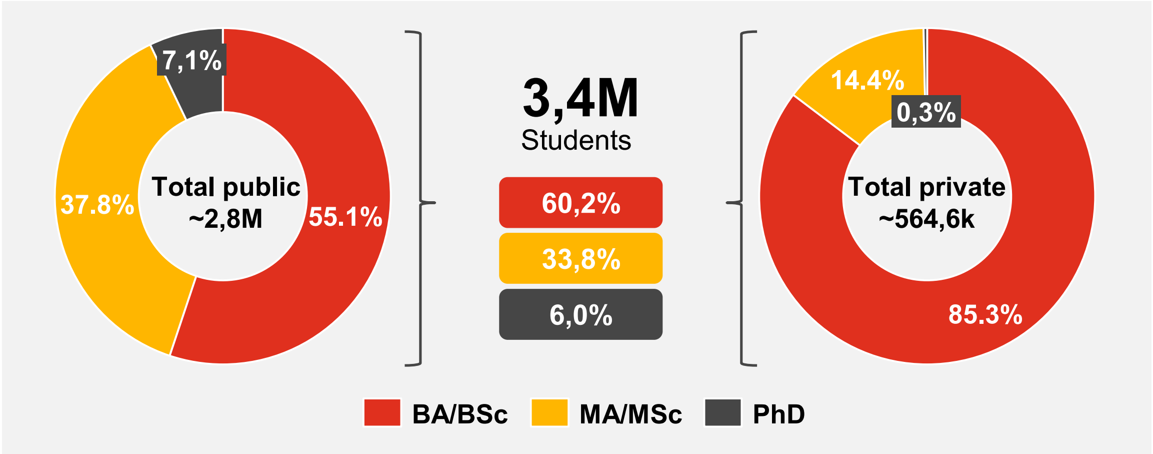
The German tertiary education system is considered as one of the best in the world, as 12 universities in Germany are ranked among the 200 best universities globally. This is also reflecting in a growing interest from foreign students of attending a university in Germany.

Share of population with university degree; in %; in 2022



Split of students by public institutions; in %; in 2022

Split of students by private institutions; in %; in 2022



Sources: Eurostat, European Commission, German Universities, Government of Germany, PwC analysis

The target population and foreign students are expected to grow, however, the share of tertiary education graduates remains bellow EU targets

Universities – Key Drivers

Below average proportion of young adults with a tertiary educational qualification

The baseline-projected demographic trends indicate a slight upward trend in the population segment aged 18-24, with an anticipated growth of 1,7% by the year 2050. The increased growth of the domestic population is expected to be supported by the growing number of foreign students in the county. The number of foreign students has increased by 55,9% or 9,3% annually from 2017 to 2022 (from 259k to 403k). This trend is also expected to continue, however, with a lower CAGR for foreign students.

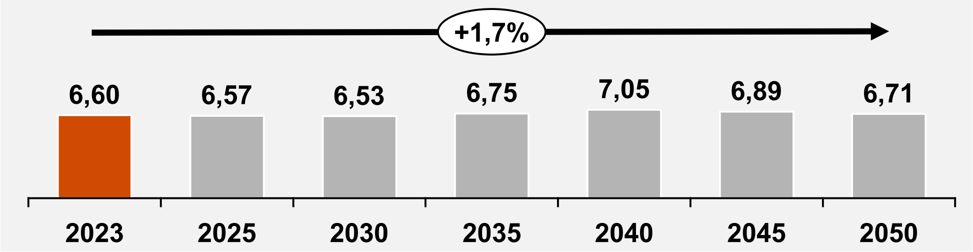
The proportion of young adults with a tertiary educational qualification in Germany remains below the EU average. In 2023, 38,4% of 25-34 year-olds had a tertiary educational qualification. This is well below both the EU average of 43,1% and the EU-level target of at least 45% by 2030. However, significant regional differences have been observed. Berlin reports significant young adult tertiary education attainment of 54,3%, already substantially exceeding the EU target for 2030. High educational attainment has also been observed in other major states such as Bayern and Hamburg. Conversely, states with the lowest attainment include Sachsen Anhalt (26,3%), Sachsen (27,7%) and Saarland (29,1%).

Although the number of students in Germany is rising from 2017 onwards, a negative trend of new enrolments can be observed from 2019. The decreasing number of newly enrolled students is especially seen in key fields for the Germany industry such as STEM studies. For example, the enrolments in mechanical engineering have decreased by 40% from 2011 to 2022.

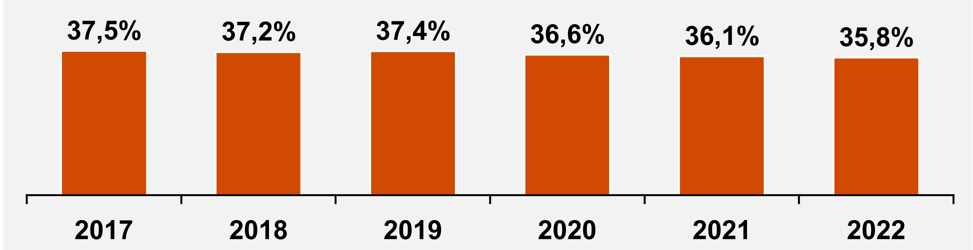
Nevertheless, The share of students enrolled in the fields of STEM remains well above the EU average. In 2022, around 35,8% of students (~1,2M) studied in a STEM program, compared to the EU average (~27,6%). However, the share of STEM students within the general student population has been decreasing from 2017 onwards (from 37,5% to 35,8% in 2022) .

In Germany, the employment rate of recent tertiary graduates in 2023 amounted to around 91,5%. The latter is well above the EU average of 83,5%, placing Germany among the top four EU countries with regard to university graduate employability. This trend can be partially attributed also to the diverse offerings of the education institutions like the dual programme, where students can study and work as part of their programme, thus offering hands-on experience for them since the start of their studies.

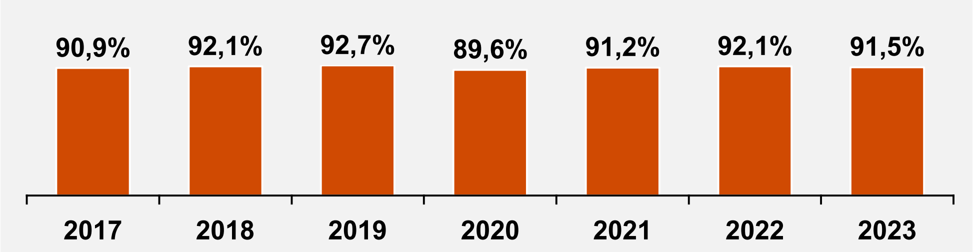
Projected population, 18–24-year-old, in mil.



Share of STEM students; in %



Employment rate of recent graduates; in %



Sources: Eurostat, Government of Germany, European Commission, University websites, PwC analysis

A growing number of foreign students is an essential driver for the growing number of tertiary education students

Universities – Demand

Increasing number of students

The total number of students in Germany has been increasing by 1,6% on a yearly basis between 2017 and 2022. In 2022, the number of enrolled students has reached 3,4M, representing an increase of around 259,9k students or 8,4% from 2018.

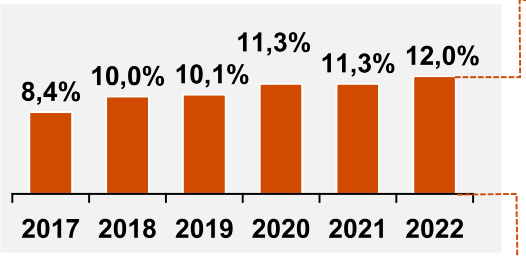
The majority of students in Germany are enrolled in BSc programmes (60,2%), followed by students enrolled in MSc studies (33,8%) and PhD students (6,0%). All three cycles are experiencing year-over-year growth in the total number of students enrolled.

However, the number of newly enrolled students has been falling since 2019 onwards with a CAGR of -2,63% (7,7% or 66k students in total). All student group enrolments have been decreasing since 2019, with Bachelor student enrolments decreasing most in absolute terms (48k or 9,3%).

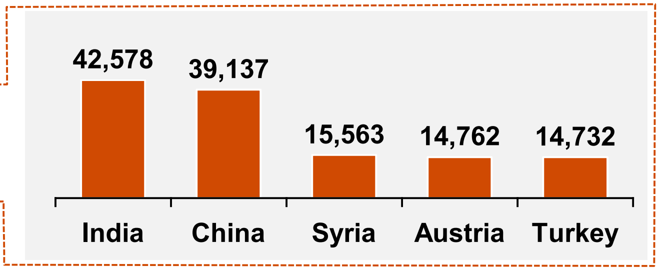
A pattern of high growth in foreign student enrolments between 2017 and 2022, indicating a growth of 9,3% on a yearly basis, has been observed. The number of foreign students has increased by ~144,6k in 2022 compared to 2017, indicating an increase of 55,9%. In total, Germany accommodates ~403,4k foreign students (12,0% of total number of students).

A high share of foreign students come from non-EU countries, with India and China being the top 2 countries with regard to the origin countries (representing ~20% of foreign students).

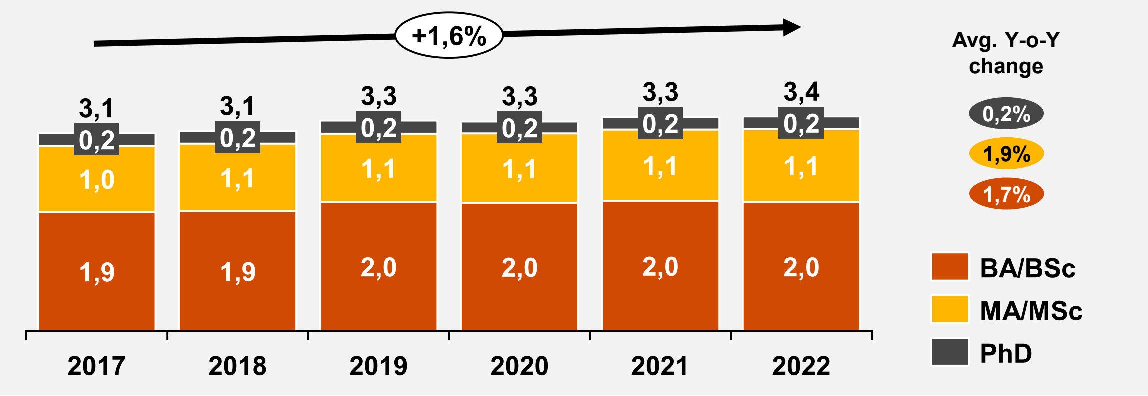
Share of foreign students; in %



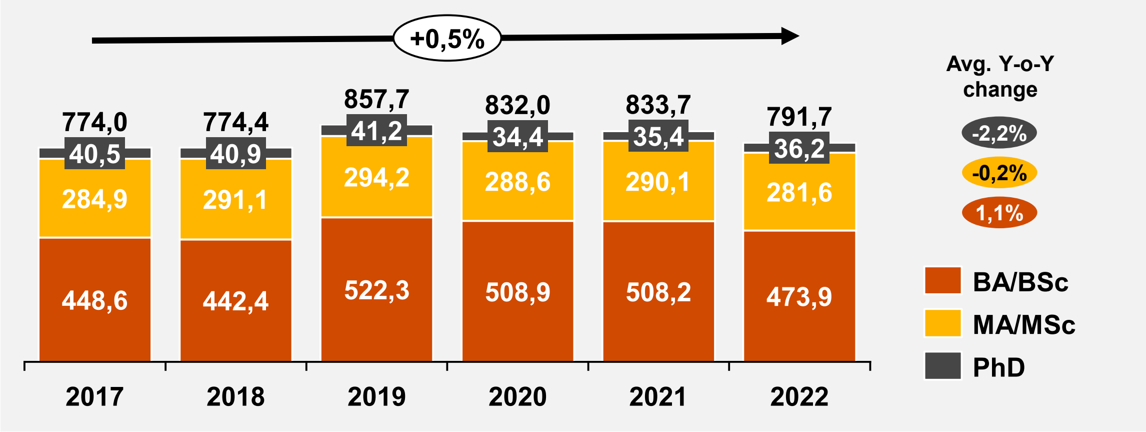
Foreign students by top 5 countries of origin



Number of tertiary education students; in mil.



Number of newly enrolled student per year; in ths.



The number of higher education institutions is slowly growing, while the student to teacher ration has improved

Universities – Supply

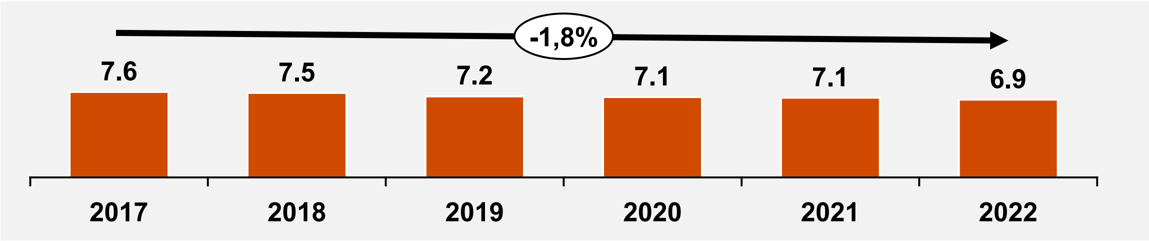
Increasing number of HEI, especially universities of applied sciences

In Germany, there are a total of 428 higher education institutions (HEIs). The majority of the institutions are universities of applied sciences (245) followed by universities (109) and colleges (74). The majority of institutions is publicly owned. In the past three years only one new university was established (public), while 5 new specialised colleges of higher education were established (4 privately owned and one publicly owned) in the same period.

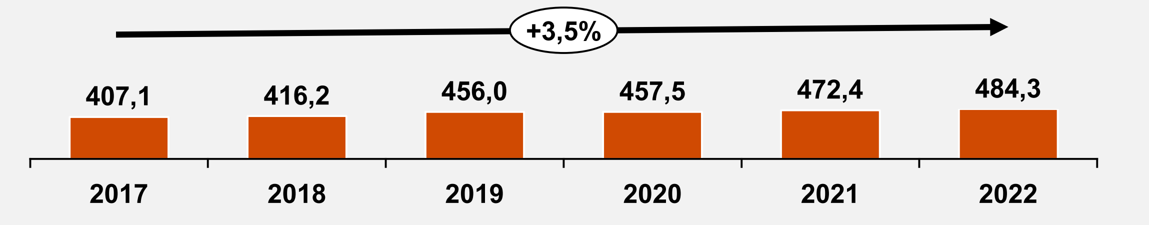
According to the German Centre for Higher Education, there are almost 700 university campuses in Germany in about 300 cities and municipalities. According to the data of 684 campuses available, 59,2% (402 units) were publicly funded, 34,2% (234 units) were privately funded and 6,6% (45 units) were funded by a church.

In Germany, an improvement in the student-teacher ratio has been observed, thus decreasing from 7,6 to 6,9 (a total decrease of almost 9%). The ratio is a good indicator of education quality in Germany, compared to the EU average student-teacher ratio of 11,7. The decrease in the ratio in Germany suggests that the growth in academic staffing (CAGR of 3,5%), outpaced the increase in student numbers (CAGR of 1,6%). In 2022, ~484,3k academic staff worked in tertiary education, which is 77,2k more than in 2017.

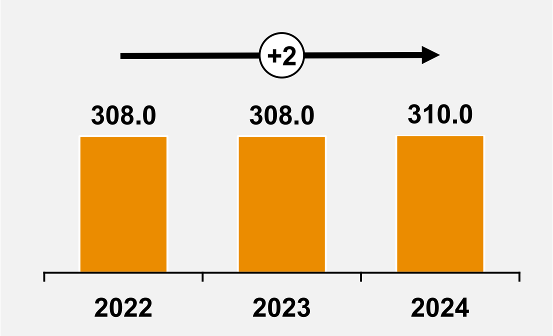
Student-teacher ratio



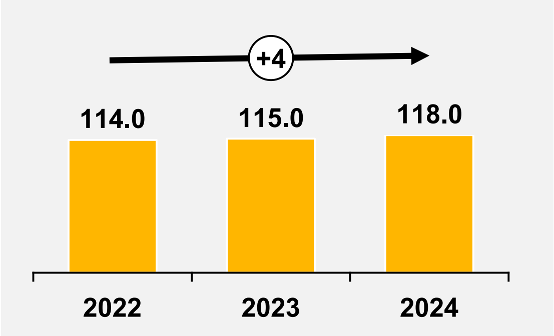
Number of academic staff in tertiary education, in ths.



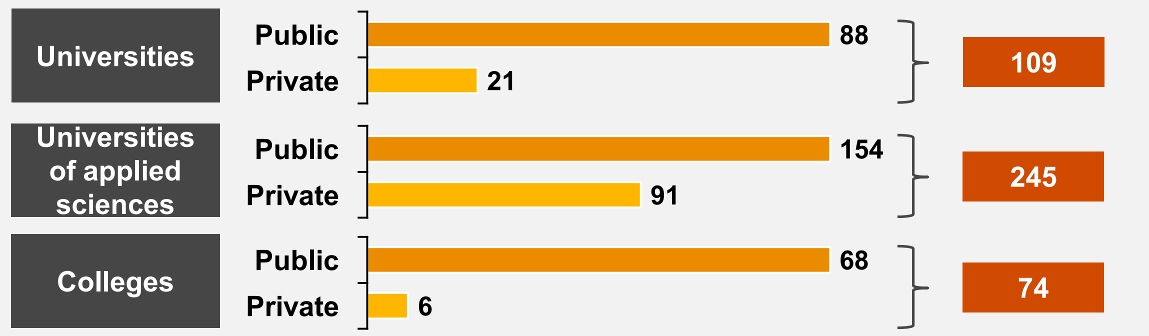
Number of public HEIs



Number of private HEIs



Tertiary education institutions and specifically universities by ownership



Sources: Eurostat, Government of Germany, German Centre for Higher Education (CHE), PwC analysis

5

Pre-school facilities

Despite a significant gap, the segment has **low potential due to fragmented stakeholders and low past funding**

Pre-school facilities

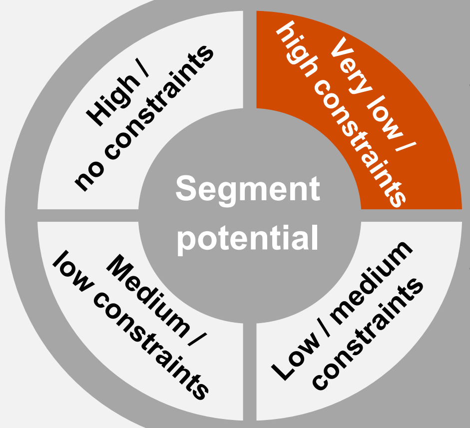
Key conclusions – Phase 1

- In Germany, early childhood education and care (ECEC) is a legal right of every child, but is not mandatory.
- Population of children has been increasing since 2018 by CAGR of 1%, driven mainly by immigration. Despite large immigration, which would increase demand for pre-schools, children of migration background are less likely to attend pre-schools.
- Children to caretaker ratio has been improving by CAGR of 1,9% since 2018, driven by the increase in number of caretakers (CAGR 3,5%).
- A demand study conducted by the Bertelsmann Stiftung confirms our findings, identifying a shortfall of 344k places in the 0-3 age category and 134k places in the 3-6 age category.

Key conclusions – Phase 2

This segment has not been shortlisted for phase 2.

PwC Assessment



Despite data suggesting that a sizable gap exists, we still do not see this a major potential for IFI funding as the volume of financing is rather small.

Stakeholders are very dispersed among different municipalities, hence deploying financing would require a lot of effort.

Key Segment Data

42 children/ 1000 enrolled

24,7% up to 2 y.o. enrolled

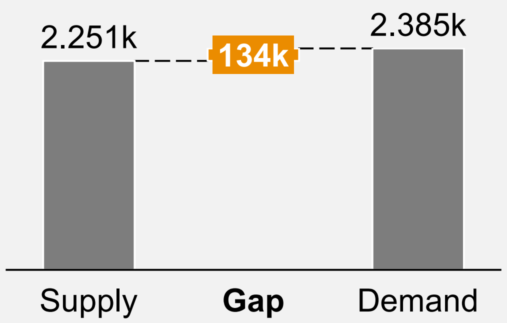
89,4% 3 y.o. enrolled

66,8% of children in private institutions

13,3% est. gap in provision of service

48M Observed past financing

Gap analysis



Early childhood education is a legal right of children from the age of one in Germany, mainly provided by non-profit entities

Pre-Schools – General Overview

Voluntary enrolment with legally backed right of access

In Germany, early childhood education is a right of all children, however, the enrolment is voluntary and is not prescribed up to the primary school. SGB VIII (Child and Youth Welfare Act) from 1996 stipulates that every child from age 3 until school entry has a legal right to a place in a day-care. This was extended in August 2013 to include children from age one. In practical terms it is the duty of local authorities to ensure a childcare slot, while the Government is in charge of policy and quality measures, as well as funding of these policies.

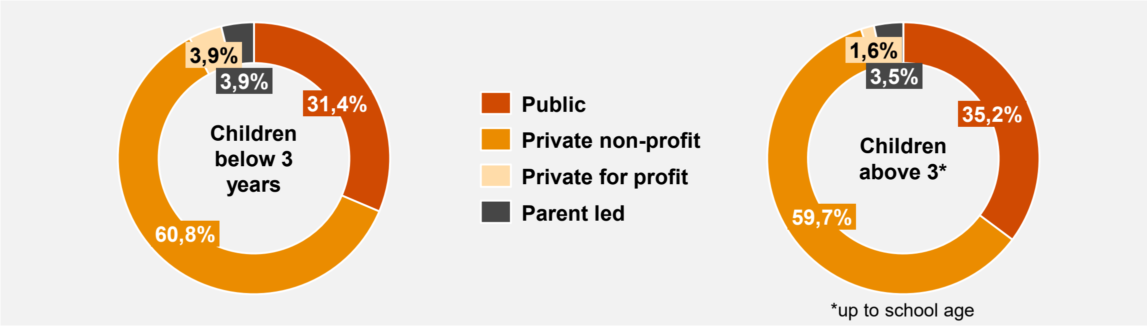
The service is provided mainly through day cares – ***Kindertagesbetreuung*** or "KiTa", majority of which are in private-non profit ownership, as shown on the chart to the right. These institutions are mainly run by charitable organisations (German Red Cross, Caritas, or similar). A significant portion (31% in 0-3 and 35% in 3-5) of day-care places is provided by public institutions, mainly with municipal ownership.

Private for profit institutions cover a small portion of the market holding 3,9% in 0-3 segment and 1,6% of the 3-5 segment. These institutions are specialised institutions usually focused on foreign languages and international children. Additionally, about 3% of places is offered by parent led initiatives, institutions where parents cooperate in jointly taking care of kids. In addition to the above mentioned, there are at-home options for parents in Germany, however due to them not having large infrastructure needs, they are not the scope of this assessment.

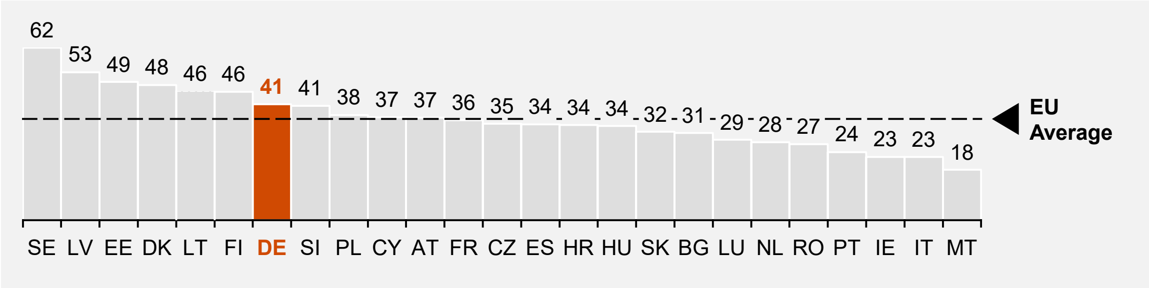
Germany is above average in terms of child enrolment, with 41 children per 1.000 citizens being enrolled as opposed to 36 in the EU. Majority of enrolment comes from the above 3 year old segment, where the percentage of children enrolled is in low to mid 90%. Germany has one of the highest maternity leaves in the EU with 14 weeks of leave allocated to expecting mothers.

Childcare is not free in all states of Germany, and some states include different levels of care in the "free-package" (e.g. 6 hours of care are covered while longer stay is paid), and the parents are expected to contribute to the meals. In case of low-income families, a day-care voucher can be issued by the youth welfare office to support the costs of care.

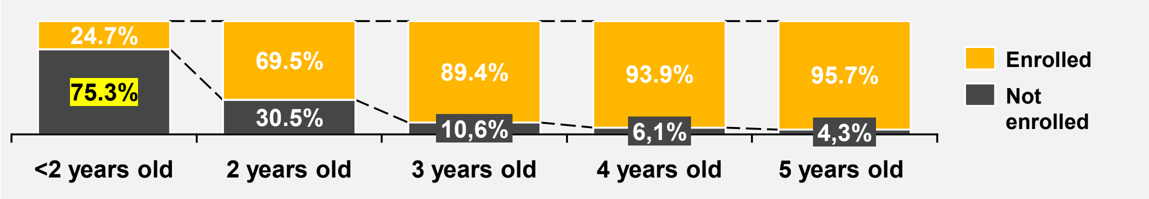
Ownership of pre-school facilities, 2021



Number of children enrolled to pre-schools per 1.000 citizens; in 2021



Share of children enrolled in pre-schools; in %; in 2022



Sources: Eurostat, European Commission, Deutsches Jugendinstitut, Early Childhood Education Germany, PwC analysis

Children with a migration background have a notably lower enrolment rate (50,4%) compared to those without (72,4%)

Pre-Schools – Key Issues

In 2021, 28,9% of all children in ECEC had a migration background

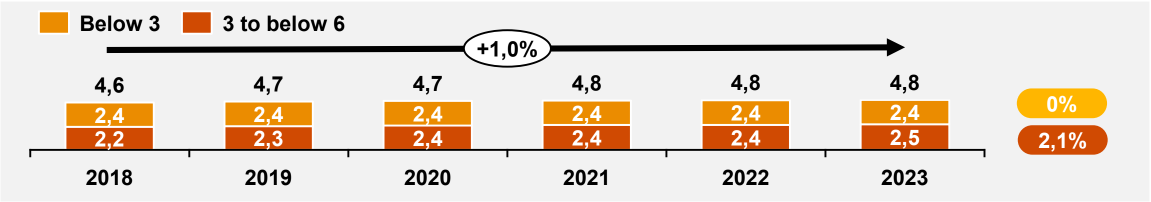
Population of children of pre-school age has been increasing by CAGR 1% since 2018, as shown on the top chart on the right. This has been driven mainly by the 3-6 group, as the population below 3 has remain stagnant within this period. This is mostly due to observed drop in new-born children of -2,5% within the same period. This would indicate a decreasing demand for pre-schools within Germany in the future. This is also confirmed by the population projections, as the projected population is expected to drop from 4,8 million to 4,5 million by 2040.

On the other hand, as Germany is key target for migration, we see an increase in non-German (immigrant) children below 6 in the observed period. This number grew by CAGR of 5,5%, meaning that the slight population increase observed is mainly due to immigration, rather than new born children. This on itself would indicate an increase in future demand, if these numbers are set to remain stable.

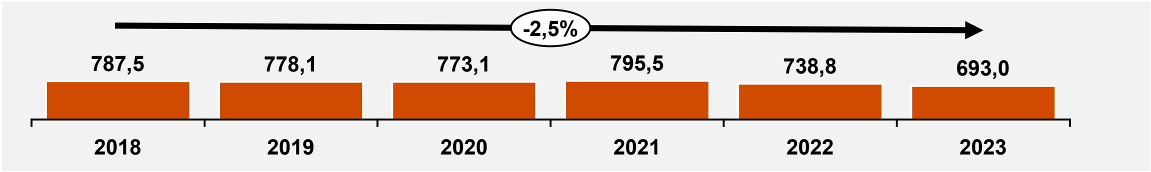
However, present statistics suggest that children with migration background have a relatively lower enrolment figures, than their German counterparts. As shown on the charts to the right, we see that in the below 3 years old category the German background children have nearly double the enrolment rate, while in the 3 to 6 category the number is slightly better at 22pp (or 29%) more enrolment. As such, increases in immigration of children do not contribute directly to the demand for pre-schools, hence we expect the demand to be negatively impacted but not in high degree.

Additional key driver is the availability of staff, initially we can observe that children to teacher ratio has been improving steadily by CAGR of 1,9% from year 2018. This is mainly driven by the increases in teaching staff of CAGR 3,1% from 596k to 737k in the same period. However, the age structure of the employed teaching staff is less than desirable. Only 1% of the total staff is below age of 24, with vast majority of 73% is above 40 years old. This would indicate that the teaching staff will soon be of the retirement age, which is to negatively impact staff availability.

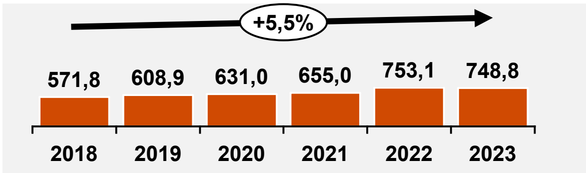
Number of children aged 0-6; in mil.



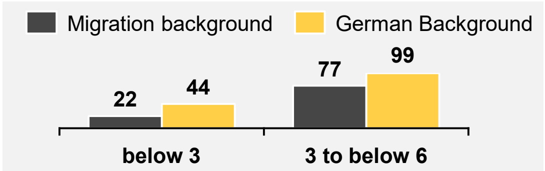
Number of new-born children; in ths.



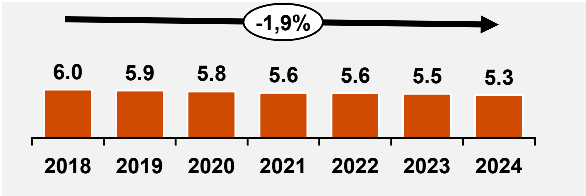
Non-German children below 6, in ths.



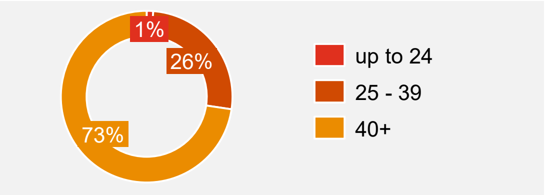
Enrolment according to background



Children to teacher ratio



Day-care staff according to age, 2024



Sources: Eurostat, European Commission, Government of Germany, Local news outlets, PwC analysis

We see a normal distribution of enrolment across federal states, with a clear need to reevaluate quotas in hours cared

Pre-Schools – Demand

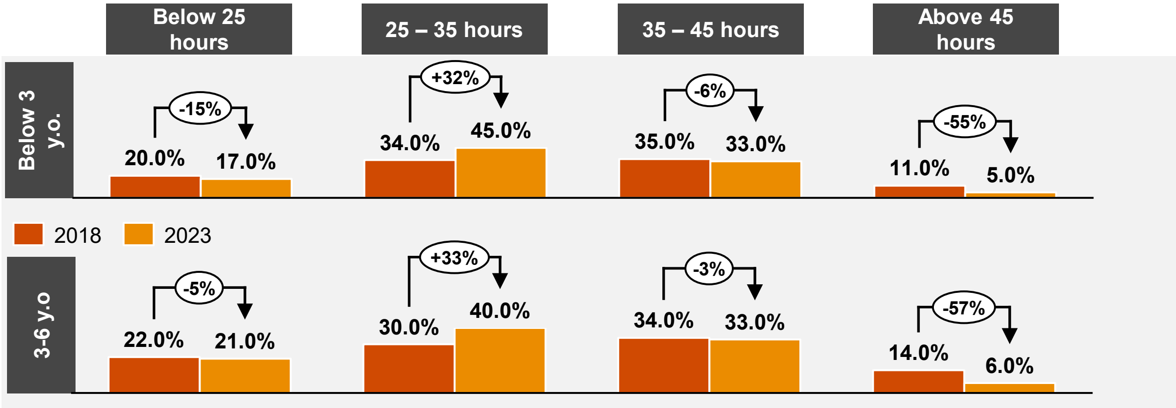
Assessment of needs indicates a change in allocation of quota for care

Overall enrolment rate for children in pre-schools is 64%, with 36% in 0-3 segment and 91% in 3-6 segment. There is 9 federal states with enrolment rates below 64% in total, 8 below in the 0-3 segment, and 4 below in 3-6 segment. Overall, we see a great difference in enrolment rates between 0-3 and 3-6 segment, however this is to be expected, as across the EU parents prefer to care for their children longer in the 0-3 segment.

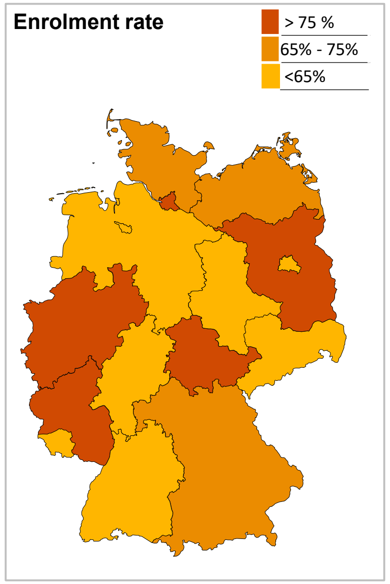
The lowest enrolment rates are in the state of Hessen and in city of Berlin, which is strange to see as Berlin offers a completely free childcare, with parents contributing only to meals, while Hessen allows for partial reduction in payment to families in need. This would suggest there are other factors at play to influence these figures.

In Germany, the weekly time child spends in the pre-schools is contractually determined. Across the country, 36% of contracts allocate 45 and more hours, followed by 34% allocating between 25 and 35 hours, 20% allocating between 35 and 45, and 11% allocating below 25 hours. This however is not fully in line with the assessed demand, as is shown below.

Assessed demand of places in Germany's pre-schools, in ths.



Enrolment rate per federal state 2023



Federal State	Enrl. rate	Enrl. 0-3	Enrl. 3-6
Germany	**64%**	**36%**	**91%**
Rheinland-Pfalz	78%	31,4%	91,3%
Nordrhein-Westfalen	77%	31,0%	90,0%
Thüringen	77%	55,8%	94,4%
Hamburg	77%	50,3%	94,6%
Brandenburg	76%	57,6%	94,2%
Bayern	73%	31,8%	91,0%
Schleswig-Holstein	70%	38,3%	89,8%
Mecklenburg-Vorpommern	65%	59,2%	94,5%
Baden-Württemberg	64%	31,0%	91,9%
Niedersachsen	62%	34,9%	91,1%
Sachsen-Anhalt	62%	59,0%	92,3%
Bremen	62%	30,7%	85,9%
Saarland	61%	33,4%	87,7%
Sachsen	61%	54,7%	93,6%
Berlin	61%	47,6%	92,1%
Hessen	59%	33,3%	90,1%

Bertelsmann foundation compiled a study on the needs of parents for early childhood education, has broken down the need categories in the same ones we have mentioned above. Essentially, we see the majority of needs both in below 3 y.o. segment and in 3-6 y.o. segment in the category of between 25-45 hours. This is to be expected as it indicates that parents need coverage for the working day. On the other hand, we see a large reduction in the needs in the above 45 hours section, indicating that the current quota allocations have to be changed.

Furthermore, we see a significant increase in the needs in the 25-35 hours category from by 32% in below 3 y.o. and 33% in 3-6 y.o. category, further indicating that this segment is where the actual demand lies.

Sources: Eurostat, Government of Germany, PwC analysis

The majority of day-care facilities in Germany is owned by non-government providers, with low supply in 0-3 segment

Pre-Schools – Supply

Supply of early childhood education in Germany

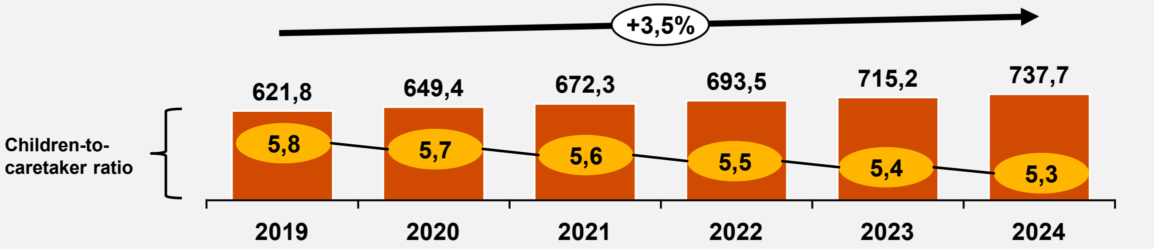
In 2023, there were 56,1k day-care facilities offering early childhood education in Germany. The majority (58%% or 35,5k) of these institutions are provided by private not-for-profit institutions, public institutions accounted for 32% share, while the private for-profit instituons had a very small share (3%). The number of day-care facilities is growing y-o-y, indicating a healthy CAGR of 1,5% between 2019 and 2023.

The map below showcases the number of institutions and number contracted places in these institutions. Essentially, we see that number of places follows the number of institutions closely, with federal states with larger number of institutions having also larger number of places. We see that the largest number of places is located in southern federal states and Nordrhein-Westfalen.

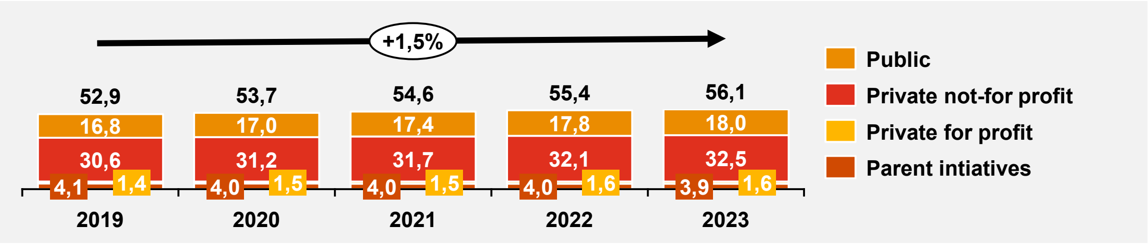
On average Germany has 2,52 children aged 0-3 per place in the institution, with some federal states (e.g. Baden-Württemberg, Bremen) having also ratios greater than 3. These ratios are a bit move favourable in the 3-6 category, where this ratio is 1,09 child per place, and federal states are generally close around this ratio.

In Germany, the growth in the number of teachers in ECEC, indicated by a CAGR of 3,5% between 2019 and 2024 is reflected in decreasing child-to-caretaker ratio, which represents an improvement in the caretaking.

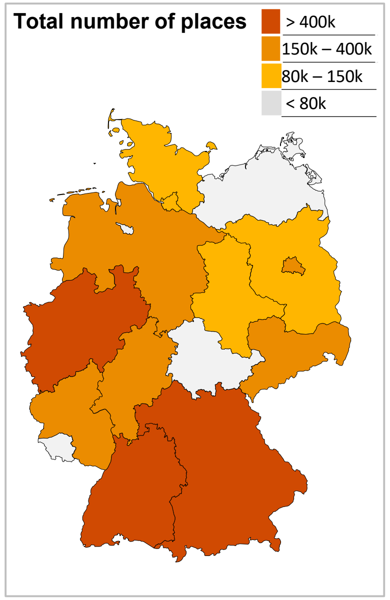
Number of caretakers in pre-school facilities (ths.) and children-to-caretaker ratio



Number of early childhood education institutions; in ths.



Geographical spread of institutions and places in 2023



Federal State	# of institutions	# of places 0-3	# of places 3-6
Germany	**3.248**	**1.623**	**0,65**
Nordrhein-Westfalen	10.668	161.026	486.485
Bayern	9.343	125.377	361.623
Baden-Württemberg	9.414	102.765	312.469
Niedersachsen	5.379	79.908	217.974
Hessen	4.308	60.377	170.628
Sachsen	2.348	53.288	105.433
Berlin	2.832	53.231	105.096
Rheinland-Pfalz	2.508	36.742	111.298
Schleswig-Holstein	1.818	29.380	73.470
Brandenburg	1.627	34.278	66.516
Hamburg	1.165	29.301	55.559
Sachsen-Anhalt	1.419	28.651	51.675
Thüringen	1.347	26.207	51.993
Mecklenburg-Vorpommern	965	21.481	39.831
Saarland	474	8.363	22.800
Bremen	462	6.209	18.162

Sources: Eurostat, Government of Germany, PwC analysis

6

Hospitals


PISO 1
ASCENSOR
SANITARIO
BANCO DE SANGRE
TERAPIA NEONATAL

The segment is **dominated by private sector players**, with **wating lists and cost of care being the main challenges**

Hospitals

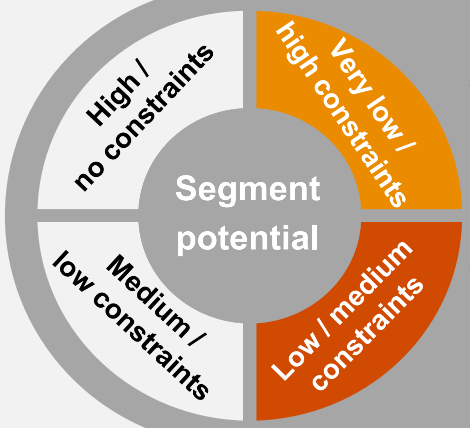
Key conclusions – Phase 1

- Majority of hospitals (71,5%) are private hospitals, split between not-for-profit centres and for-profit centres. 52,5% of beds are also owned by private players, indicating a well developed private sector.
- Health insurance is compulsory, and nearly 99% of all hospitals accept national health insurance schemes, enabling high degree of right to choose the provider.
- Main unmet need in Germany are waiting lists, reported by 21,3% of population, as well as the expense of healthcare, which is reported as an unmet need by 13,2% of population.
- Similarly to other EU countries, we see in Germany as well a reduction in hospital bed days and bed capacities, mainly caused by a shift in focus from in-patient to out-patient care.

Key conclusions – Phase 2

- The demand for hospital care is rising, influenced significantly by an ageing population which adds pressure to healthcare resources.
- The largest gap observed by stakeholders is the underfunding of investment costs due to states not fulfilling their responsibilities, which has led to a significant investment gap (over 7B EUR identified by stakeholders).
- Key underfunded areas include equipment upgrades, digital infrastructure, and facility modernisation.

PwC Assessment



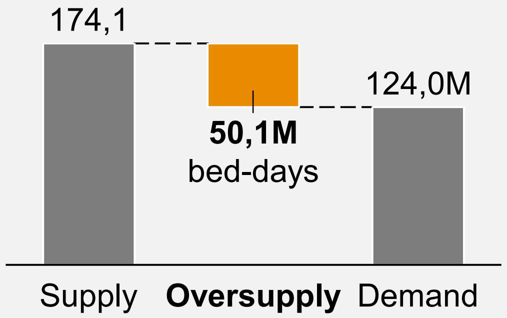
The German healthcare system is under considerable financial pressure, with low investments in hospitals, and worsening financial stability of hospitals.

Oversupply is lower than in other EU countries, this would mean that, despite existence of spare capacities there is still a room to develop further capacities.

Key Segment Data

- **1.874** number of hospitals
- **476k** number of hospital beds
- **28,5%** share of public hospitals
- **46,9%** of hospital beds are public
- **7,3bn** identified investment needs
- **71,2%** utilisation rate of beds

Oversupply analysis



In Germany, the healthcare planning and provision of services is under the responsibility of corporatist bodies

Hospitals – General overview

Definition of the segment and ownership

Germany's hospital system is decentralised in nature, where national Government, through the Federal Ministry of Health, is taking care of policy setting and strategy, while regional hospital planning and infrastructure investments are delegated to the German Federal States.

Majority of hospitals, 71,5% are owned by private players, split between not-for-profit (31,5%) and for-profit players (40%). Similarly, private players also own majority of hospital beds at 52,5% of beds. This indicates that private hospitals play a significant role in Germany, hence the legislation does not differentiate between the ownership of hospitals, and all means of funding are available to all players.

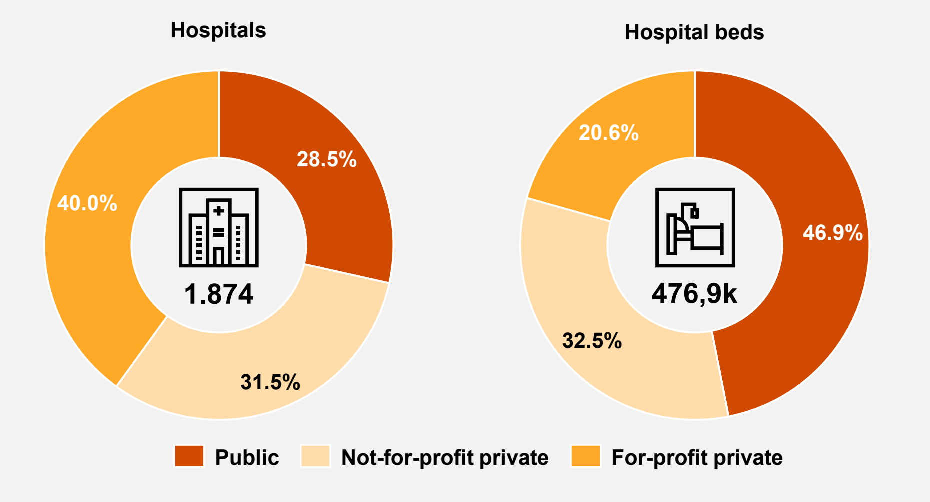
Health insurance in Germany is compulsory and provided either under the statutory health insurance (SHI) or through substitutive private health insurance (PHI). Almost all (99%) of hospitals in Germany accept both SHI and PHI patients, with only small number of hospitals accepting only PHI patients. Within SHI the patients are free to choose the hospital they will go to, but they cannot choose the doctor, while PHI patients have full choice along with additional benefits.

The funding of hospitals operates on two tier model, the funding for procedures is handled by health insurers (SHI or PHI) using *Diagnosis related groups – DRG* that replaced per-diem financing, where hospitals receive funding for specific procedures grouped in specific DRGs in lump sum format to cover entire cost of specific DRGs. The price of DRGs is negotiated by healthcare players on multi-annual basis.

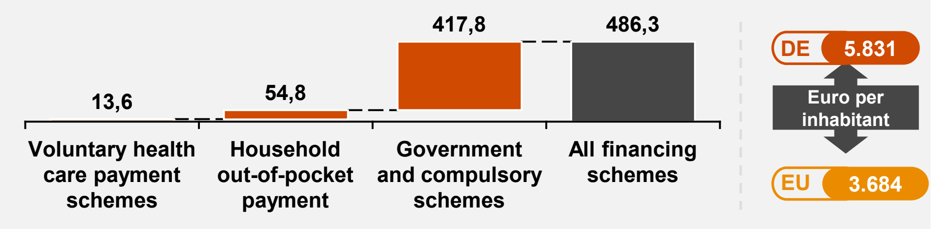
Investments in hospitals are generally funded by Federal states for those hospitals that they include in their regional hospital plan. However, in recent years there is a growing gap between the investment needs and the funding provided by the Federal states. Hence, hospitals are forced to seek funding from other sources including own equity and external debt. It should be noted that legislation recognises hospitals as independent bodies (companies) and permits them to procure external debt, which is dependent on hospital solvency.

In 2022, total health expenditure in Germany amounted to ~486,3B EUR. Around 85,9% of financing is channelled through the government and compulsory schemes, followed by out-of-pocket payments (11,2%) and voluntary health care schemes (2,8%). The health expenditure per inhabitant in Germany (~5,8k EUR) is significantly higher compared to the EU average (~3,7k EUR).

Healthcare ownership; 2022



Healthcare Expenditure by Financing Scheme; in EUR; in bn; in 2022



Sources: Eurostat, European Commission, Government of Germany, World Health Organization (WHO), PwC analysis

One of the key issues in Germany is low investment in hospitals, and worsening financial performance

Hospitals – Key Drivers & Issues (1/3)

While Government investment rate drops hospitals are required to pick up the slack

As mentioned on the previous slide Germany operates on two tier hospital financing model, where investments are supported by the Federal Government's. However, as seen on the top chart to the right the investment rate, expressed as the amount of funds received through this financing model divided by total hospital costs, is reducing significantly in past years. The investment rate dropped by 7,9pp from 1991 to a low of 3,5% in 2020.

This development has resulted in a large unmet need for investment funding in hospitals, as assessed by German Hospital Federation – DE: DKG (association of all hospitals in Germany, representing interests of both public and private hospitals). The investment needs are assessed at 7,3bn EUR in 2022 up from 6,1bn in 2020, a CAGR growth of 9,4%.

The assessment by DKG has indicated that hospitals are mainly supplementing these funds through the combination of funds from DRG scheme, external loans, or donations. According to national audit report in 2018 German hospitals have averaged 60% share of own funds (non-national funds) invested into infrastructure. These investments mainly covered construction projects, IT, equipment purchase both for operating theatres and large medical equipment.

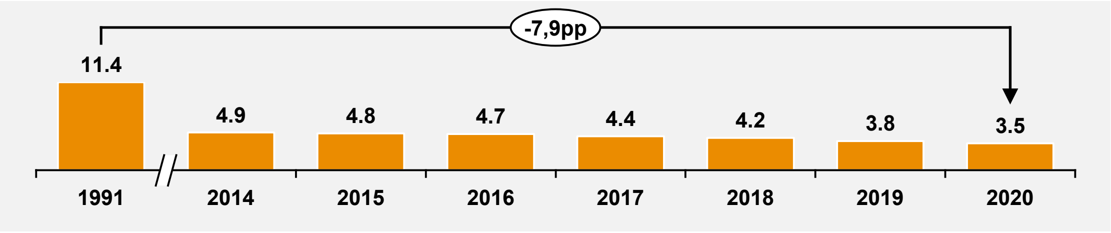
Worsening financial performance impacts hospitals' ability to invest

On the other hand, German hospitals are recording worsening financial performance in the past few years. As presented on the middle right chart 11% more hospitals are reporting budget deficit in 2022 than in the year 2021. This is expected to grow by additional 24pp in year 2023 resulting in total 35pp increase in three years.

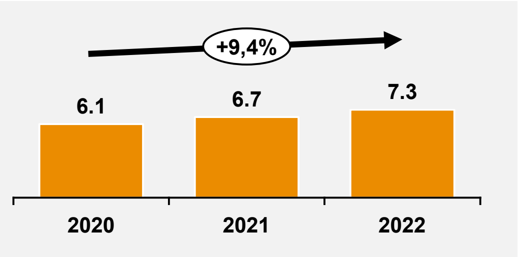
Additionally, German Hospital Institute assessed in 2022 hospital barometer that 77% of hospitals declare their financial situation as unsatisfactory. This assessment is worst with large hospitals (600+ beds reporting 85%), followed by smaller hospitals (up to 299 beds reporting 80%).

This situation, according to mentioned reports is mainly caused by impact of inflation on costs of provision of service, and the fact that the prices for DRGs have not been adjusted since the inflation, causing large pressure on hospitals, and limiting their potential for investments.

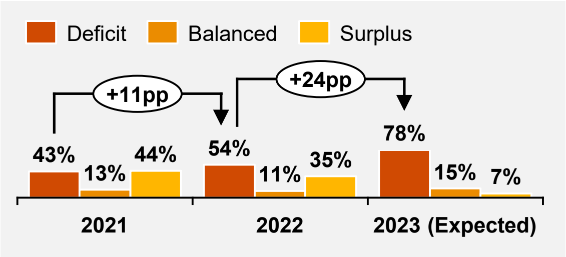
Hospital investment rate in %



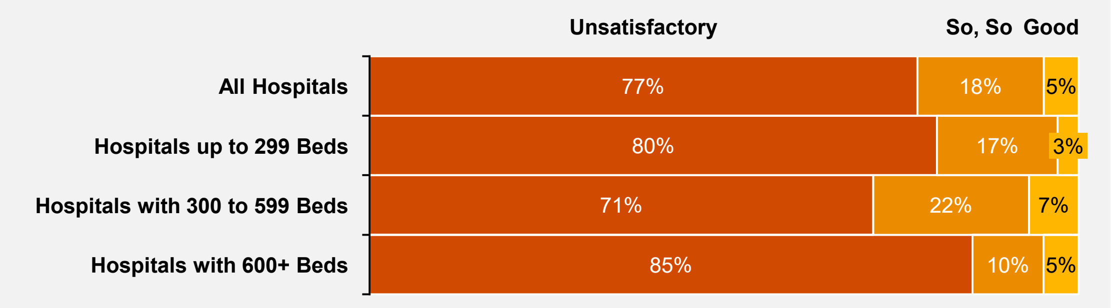
Assessed investment needs in bn EUR



Financial performance of hospitals



Self assed financial situation in 2022

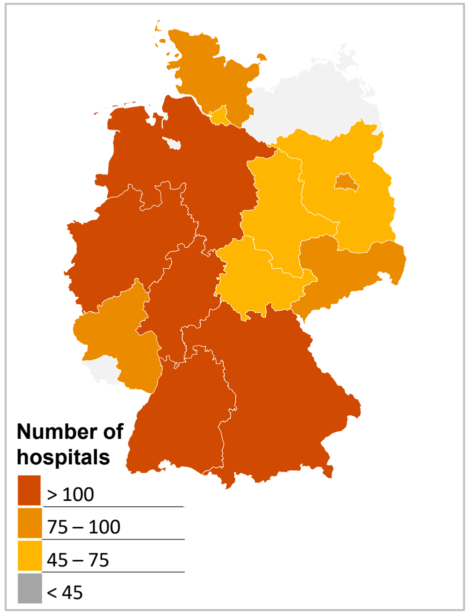


Sources: Government of Germany, German Hospital Federation, German Hospital Institute, PwC analysis

The majority of unmet needs are waiting lists, with ageing personnel causing potential shortages in the future

Hospitals – Key Drivers & issues (2/3)

Regional split of hospitals, beds, doctors and nurses; in 2023



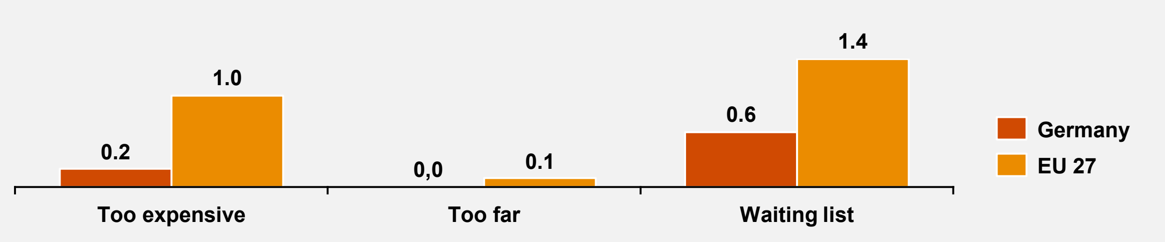
	Total	Per 100.000 inhabitants		
Federal State	**# Hos.**	**# Beds**	**# Doc**	**# Nurs**
Germany	**1.874**	**571**	**216**	**489**
Bayern	352	556	220	490
Nordrhein-Westfalen	328	620	229	518
Baden-Württemberg	244	467	196	408
Niedersachsen	169	498	183	431
Hessen	148	544	198	478
Schleswig-Holstein	91	526	197	452
Berlin	88	535	272	552
Rheinland-Pfalz	86	559	187	441
Sachsen	76	605	213	524
Brandenburg	63	581	181	471
Hamburg	63	676	332	664
Thüringen	48	710	230	570
Sachsen-Anhalt	45	638	229	517
Mecklenburg-Vorpommern	38	626	237	563
Saarland	21	669	241	591
Bremen	14	600	255	628

In 2023, the provision of hospital beds in Germany amounted to 571 hospital beds per 100.000 inhabitants. The ratio is significantly higher compared to the EU average at around 520 hospital beds per 100.000 inhabitants. There is a clear east and west Germany split in regional distribution of hospitals, with federal states belonging to former West Germany having more hospitals. In terms of beds, number of doctors and nurses, we see pretty even regional split, where distribution is close around average of Germany. However, research would suggest that despite equal regional split of beds and personnel, there is an issue of rural access to healthcare, where rural areas usually have to travel for more than an hour to reach hospital care.

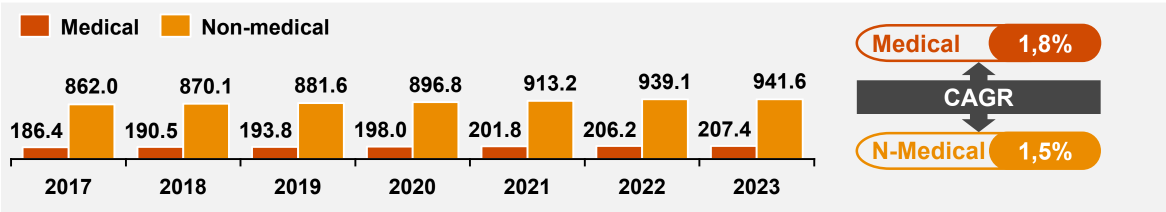
The reported unmet needs of the German population regarding healthcare are well below EU averages, with Germany reporting a lower share of unmet needs across all segments. The biggest gap is seen in waiting lists, where the EU average is 2,3 times higher than Germany (0,6% in Germany compared to 1,4% for the EU average).

We see a clear trend of increasing number of medical personnel in Germany, with both medical and non-medical staff increasing by CAGR 1,8% and 1,5% respectively. However, this rise is mostly attributed to immigration, and some report suggest that the key issue here lies in relative age of the staff. The majority of staff is older than 50, especially in non-medical staff category, meaning that they are close to retirement age, which will cause shortages in the future.

Self-reported unmet demands of population by reason; in % of population



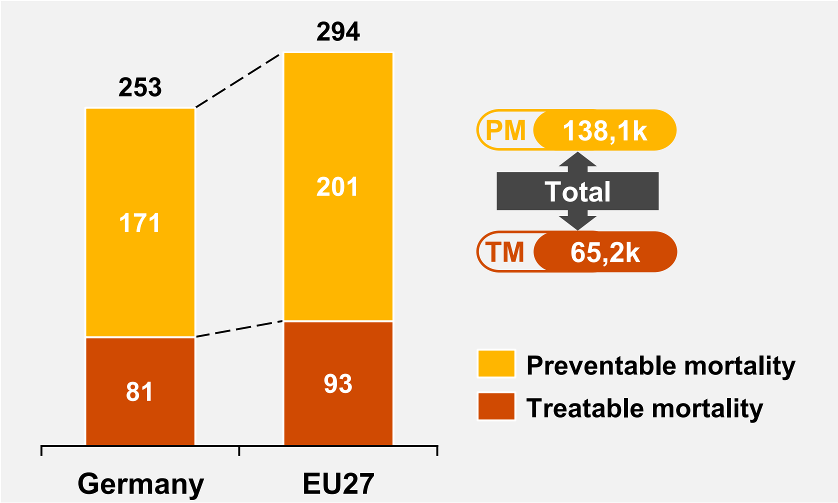
Medical personnel per hundred thousand inhabitants



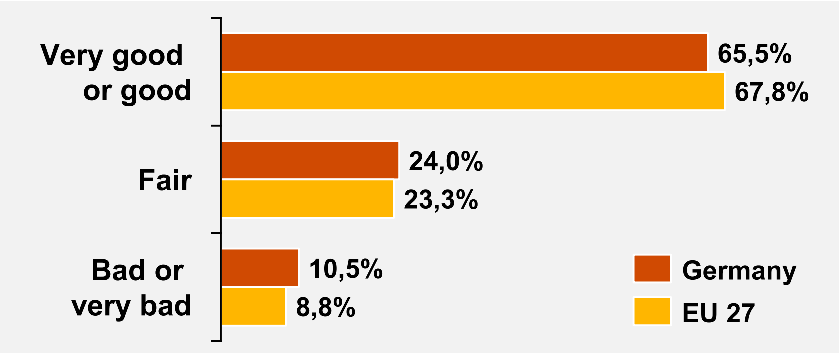
Sources: Eurostat, Government of Germany, PwC analysis

While preventable and treatable mortality rates are below the EU average, more Germans perceive themselves as in bad health

Preventable Mortality (PM) and Treatable Mortality (TM)



Self-perceived health, and risk factors; in %; in 2023



Notably, the German population reports lower self-perceived health compared to the EU average

Germany places below the EU average, both for the rate of preventable mortality (171 to the EU average of 201) and for treatable mortality (81 to the EU average of 93). In total mortality rate in Germany equals ~253 deaths in 100.000 inhabitants, a figure 14% lower compared to the EU average rate. Germany's lower preventable mortality rate suggests that its public health initiatives – such as disease prevention, health education and lifestyle interventions – are relatively effective compared to other EU countries. This means relatively fewer people in Germany die from conditions that could have been avoided through preventative measures. Moreover, the relatively lower rate of preventable mortality in Germany compared to the EU average, indicates a strong healthcare system where timely medical treatment and effective management of conditions – as indicators of healthcare access and quality – reduce mortality.

In 2021, there were a total of 138,1k preventable and 65,2k treatable deaths, respectively. In the same year, Germany reported ~1,1M deaths in total, with identified leading causes of death being diseases of the circulatory system, accounting for around 33,3% of all deaths, followed by neoplasms (23,1%), and ischaemic heart diseases (22,4%).

It should be noted that research suggests, that diseases of the circulatory system are key health determinant in Germany, and they pose significant challenge for healthcare system in the rural areas. Considering the nature of these diseases quick reaction, and/or continuous screening is needed, which is proving hard to organise in more rural areas of Germany.

In 2022, ~65,5% of the population aged 16 and above perceived themselves as either in good or very good health, which is slightly below the EU average (~67,8%). Moreover, almost 2 percentage points more people indicated bad or very bad self-perceived health in Germany (10,5%), compared to the EU average.

According to Eurostat (2019), ~18,5% of German adults were characterized as obese, a figure above the EU average of 16,0%. Moreover, tobacco consumption and nutritional habits in Germany were worse compared to other countries in the EU.

Health determinants of lifestyle; in %; in 2019

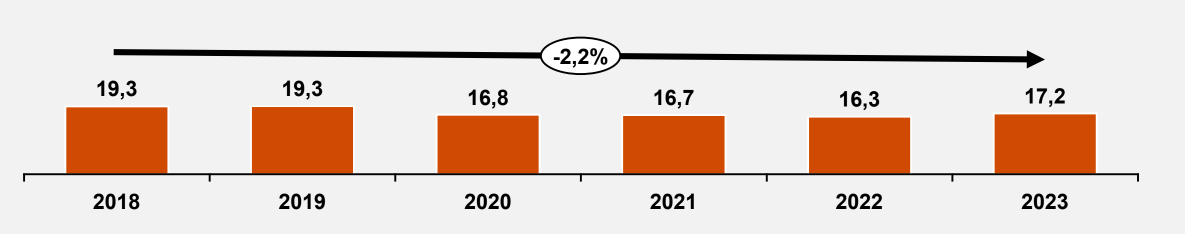
Health determinant	Germany	EU-27
Obesity	18,5%	16,0%
Tobacco consumption	5,4%	4,9%
Alcohol consumption	7,5%	8,4%
Nutritional habits	10,5%	12,4%
Physical activity	26,7%	13,6%
Strong social support	38,1%	37,8%

Sources: Eurostat, Government of Germany, World Health Organization, PwC analysis

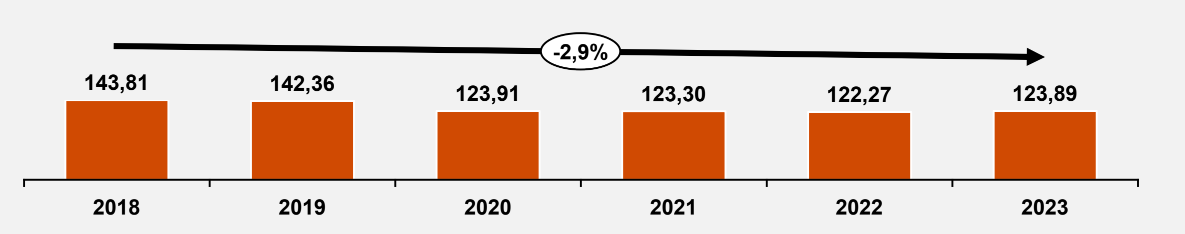
While hospital discharges and bed-days have declined over the years, the average length of stay has remained stagnant

Hospitals – Market Demand

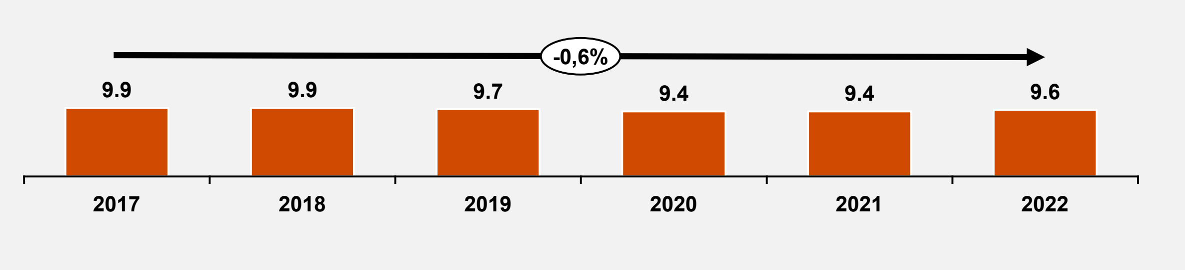
Number of hospital discharges in Germany; in mil.



Number of hospital bed-days for in-patient curative care; in mil.



Average number of visits to physicians, per capita



A downward trend in discharges and hospital bed-days has been observed

Over the past years, the number of hospital discharges in Germany has been declining year-over-year by a CAGR of 2,2% between 2018 and 2023, totalling approximately 17,2M in 2022. The biggest decrease has been observed within the COVID-19 pandemic, with the numbers starting to rebound in year 2023.

In Germany, the number of hospital bed-days for in-patient cases over the years indicates a similar decline as with the number of discharges, reflected by a CAGR of -2,9% between 2018 and 2024. Similarly to the number of discharges these numbers have seen a slight uptick in 2023.

Among the European countries, Germany has one of the highest number of medical doctor consultations per inhabitant totalling 9,6 – a figure only below Turkey (10,0) and Italy (9,7). Interestingly, this number has only dropped slightly during COVID-19 pandemic, which is different than other EU countries, which have had a sharp drop of medical consultations. This would indicate that the primary care segment has continued to operate even during he COVID-19 pandemic.

As such the slight decline in discharges and bed days can be attributed to shifting of priorities from in-patient to outpatient care, which was also observed by German Hospital Institute.

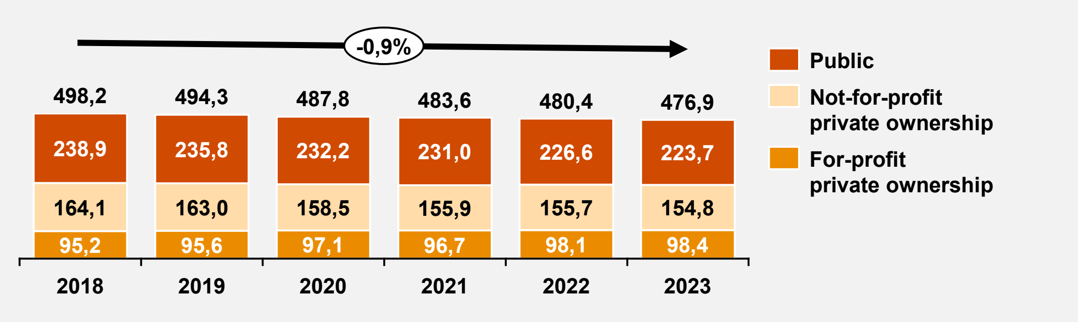
The inpatient length of stay over the past years has remained stagnant. In 2022, the figure averaged ~7,2 days, which is well above the estimated EU average of ~6,3 days. According to the data available, this places Germany among the six EU countries with above 7 inpatient days – only behind Portugal (9,4), Liechtenstein (9,0) and Serbia (8,2). Moreover, the national statistics data reveals that 6 federal states reported above-average in-patient length of stay, namely the Federal States of Schleswig-Holstein (7,8), Brandenburg (7,8) Hamburg (7,6), Bayern (7,4), Hessen (7,3) and Berlin (7,3).

Sources: Eurostat, Government of Germany, World Health Organization (WHO), PwC analysis

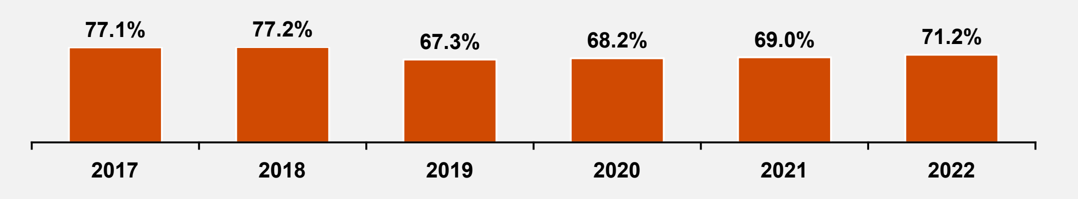
Although the number of hospital beds decreased, mainly driven by public beds, slight growth in private beds has been observed

Hospitals – Market Supply

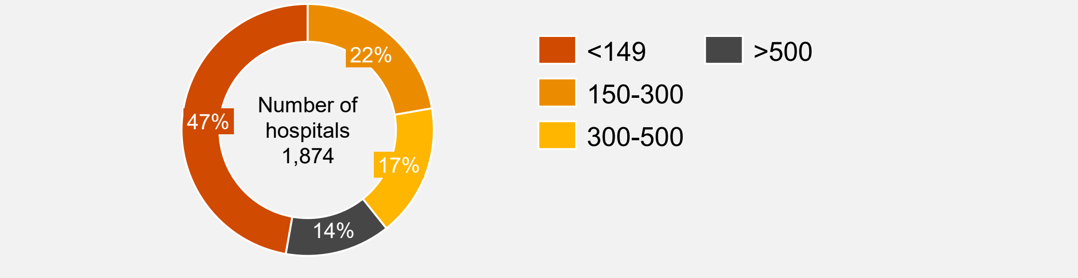
Number of hospital beds; in ths.; 2022



Inpatient curative care bed occupancy rate; in %



Size of hospitals, 2023



Inpatient beds occupancy rate has been decreasing substantially over the years

In 2023, the majority of hospital beds in Germany were privately owned, accounting for around 71,5% of all hospital beds in the country. However, looking at the hospital beds, public sector holds a larger share of beds at 47% of all bed. Furthermore, large portion of hospital beds is owned by private, not-for-profit institutions.

In accordance with a declining trend in the number of hospital beds across the most developed countries, Germany has witnessed a slight y-o-y decline of around 0,9% between 2017 and 2022. This reduction in hospital beds over the past years represents a decrease of around 21,3k beds or ~5%. The latter is mostly driven by a decrease in the number of publicly owned hospital beds (decreasing by a CAGR of 1,1%), followed by a decrease in the number of hospital beds under not-for-profit ownership (decreasing by a CAGR of 1%). Interestingly, the data reveals that the number of hospital beds under private ownership recorded a slight y-o-y increase of ~0,6%.

The inpatient hospital bed occupancy rate in Germany has been experiencing a steady decline, decreasing from 77,1% in 2017 to 69% in 2022, after which it rebounded to 71,2%. This trend was particularly pronounced in 2020, during the height of the COVID-19 pandemic, when the utilisation rate dropped from 78,9% in 2019 to 69,6% only a year after, marking the lowest point in the observed period. Although a slight rebound in hospital bed occupancy rate has been observed in the following years, the numbers are still not at the pre-pandemic rates. Despite the observed decline between 2017 and 2022, Germany's occupancy rate remains above the estimated EU average hospital bed occupancy rate of around 66,6%.

Germany's is dominated by smaller hospitals, with large portion having below 150 beds, as shown on the chart to the left. Larger hospitals accounted for only 14% of the entire number of hospitals in 2023. This is to be expected as the national strategy is to follow a large dispersal of hospitals across the country, which would require smaller hospitals, rather than a centralised health service. This is done to improve access to healthcare to all citizens. Larger hospitals are located in larger population centres such as Berlin or Munich.

Sources: Eurostat, Government of Germany, PwC analysis

7

Retirement homes

Despite the current observed oversupply, **demand is projected to outpace supply by 2035**

Retirement homes

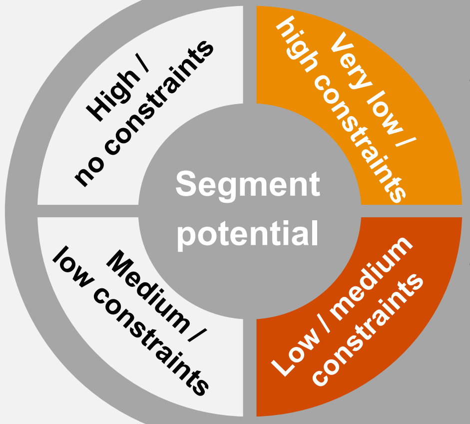
Key conclusions – Phase 1

- 89,7% of all institutions are focused on in-patient care, with 9,9% being mixed care institutions.
- German Government has prepared an assessment of the people in need of LTC care, which grew by CAGR of 8,9% since 2016 from 3,1M to 5,7M. Growth of people in need of LTC is projected to rise to 6,3 million by 2050.
- On the supply side, we see a pretty stable supply that grew by slight 0,8% CAGR between 2016 to 2023.
- Projections indicate that by the year 2035 the current oversupply of beds will overturn into a gap, hence we see this segment as interesting for CEB.

Key conclusions – Phase 2

- Stakeholders anticipate rising demand for care services due to an ageing population. They also highlighted the urgent need to improve training and attract more staff.
- Stakeholders noted that limited public funding makes infrastructure investment difficult, as the state has largely withdrawn support, leaving local authorities and private initiatives to bear the burden.
- Retirement homes face significant infrastructure deficits, with many facilities outdated and requiring modernization.

PwC Assessment



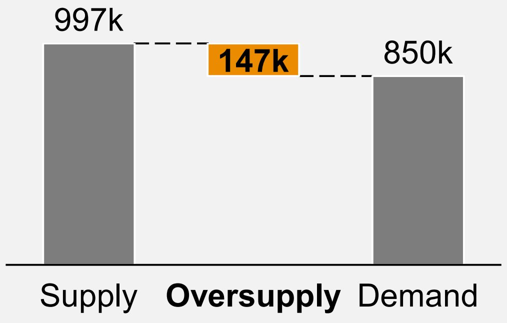
Currently there is an oversupply, however, we expect that the demand growth will outpace supply growth by 2038, thus creating a sizeable gap.

Considering that majority private ownership, and the overall reduction of investment financing, players will need funding to support projected growth.

Key Segment Data

- **15,5k** number of residential homes
- **1,1k** LTC spending per capita
- **1,3%** public nursing places
- **0,8%** CAGR of nursing places
- **4** states with affordability issues
- **5,7M** people in need of LTC

Oversupply analysis



Majority of LTC homes are in private ownership, coverage is guaranteed for all persons, who can choose the provider

Retirement Homes – General Overview

Organisation of the system

In Germany, long-term care (LTC) or senior living encompasses several types of options tailored to the needs of the elderly, each offering different levels of care, services and independence.

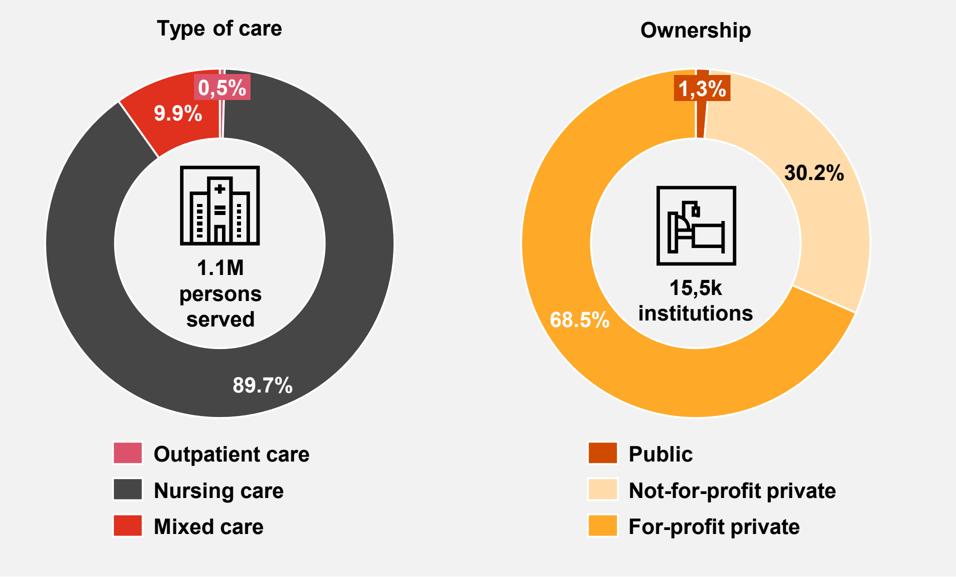
- **Outpatient care** – where care is provided within the person's home and not in a dedicated facility. These services encompass help with household management, personal assistance, maintenance of social contracts and skills and similar. These services do not need to be provided by a nursing professional, though providers have to be qualified and experienced.
- **Nursing care** – where care is provided within the dedicated nursing home by specialist nursing staff.
- **Mixed care** – where a facility operates both types of care.

Majority of homes are nursing care homes (89,7%), while other types of care hold relatively small percentage. Majority of institutions are owned by the private sector (98,5%) with majority being for profit institutions (68,5%). However, German LTC system, similarly to hospital segment, ensures coverage of all individuals in need of care regardless of the ownership of the institutions. Hence, all providers have to accept payments from the insurance schemes.

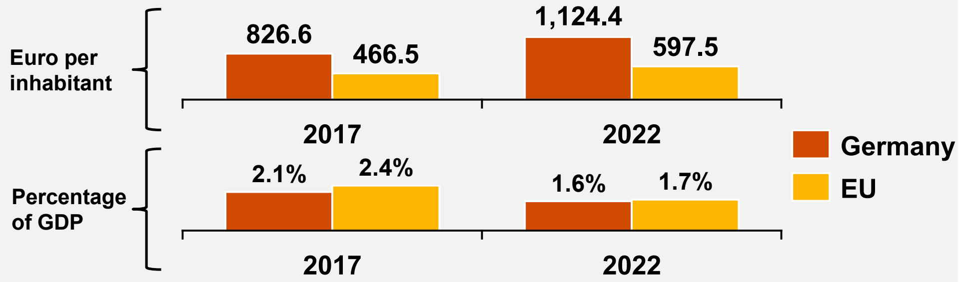
German LTC is financed through the compulsory insurance systems (compulsory long-term care insurance – LTCI). LTCI comprises two independent parts, the social (public and non-profit) and the private LTCI. About 88% of the population is insured through the social LTCI and 12% through private LTCI. Higer income individuals have to contribute to private LTCI, while the rest are covered through social LTCI. Both of them are designed as compulsory insurance with identical benefits. The benefits are determined based on the assessment of individual's need, and are split into five categories of need.

Germany's expenditure on LTC is slightly below EU average as a % of GDP, and has dropped from 2,1% in 2017 to 1,6% in 2022. However expressed in euro per inhabitant, we se a significant increase in the same period from 826 to 1.124, an increase of 36%. This disparity is mainly due to significant GDP growth in the same period, hence the reduction in % of GDP figure. On the other hand, this entails a significant increase in direct benefits to the population, however research suggests that gaps in affordability still persist despite these increases.

LTC ownership; 2022



Long-term care (health) expenditure



Sources: Eurostat, European Commission, Government of Germany, Local news outlets, DEStatis, PwC analysis

Germany has a high and growing share of the elderly reflected in an above-EU average old-age dependency ratio

Retirement Homes – Key Drivers (1/2)

Life expectancy and healthy life years ratios are below the EU average

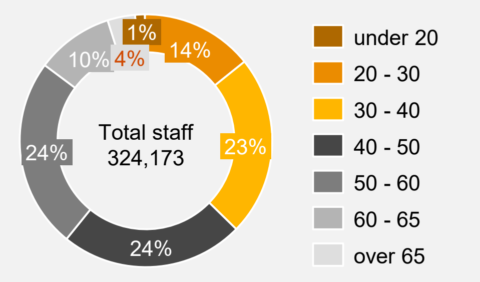
In 2023, the average life expectancy at birth in Germany was around 81,2 years old, a figure slightly below the EU average. Historically, Germany had a life expectancy rate in line with the EU average, however, over the past years, slight fluctuations in average life expectancy have been observed both in Germany and other EU states. According to the data available, in 2022, a difference between the life expectancy of a male and female averaged around 4,7 years (EU average at 5,4 years) being 78,3 years for males and 83,0 years for females.

The German population aged 65 could on average expect to live for 19,3 more years (compared to the EU average of 19,5), reaching 84,3. Males of the same observed age class could expect to live for around 17,6 more years, while females for 20,8 more years. Moreover, according to Eurostat data from 2022, German inhabitants aged 65 years or above recorded around 8,4 healthy years compared to the EU average of 9,1 years in 2022.

In 2023, the old-age dependency ratio (the number of individuals aged 65 or older per 100 people of working age) in Germany (34,7%) was slightly above the EU average (~33,4%), however it should be noted that the ratio is starting to stagnate in the last year.

One of the key issues in Germany is the availability of nursing staff, where the ratio of patients to nurses providing care is 2,46, meaning that nurses have enough capacity to provide sufficient degree of care.

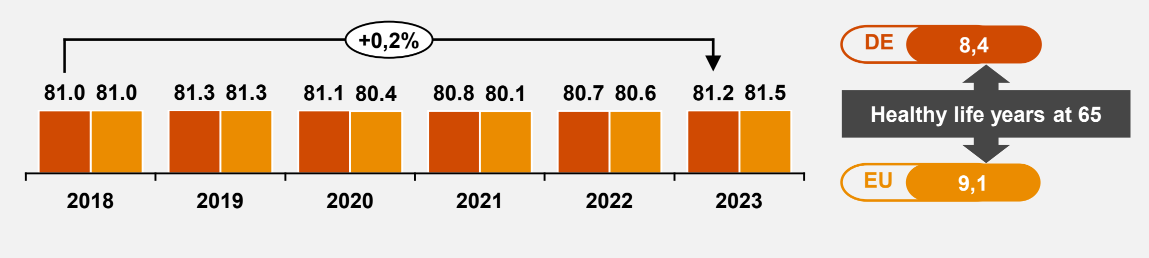
Care providing nursing staff by age



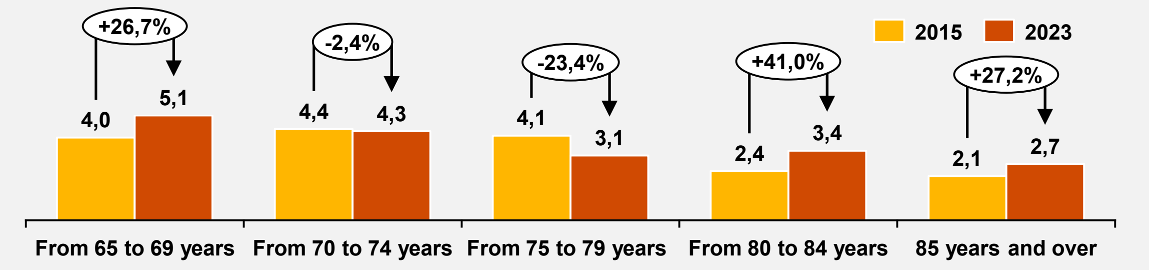
However, as shown on the graphics to the left, the age of the available staff could pose shortages in the future. This is so as majority of the staff is currently aged 40 and above, and 4% of the staff is of retirement age, with additional 10% who will be so in 5 years.

Additionally, research suggests that this staff is mainly coming from immigrant backgrounds, which poses slight language and cultural barrier. This is unlikely to improve due to low nursing graduate numbers.

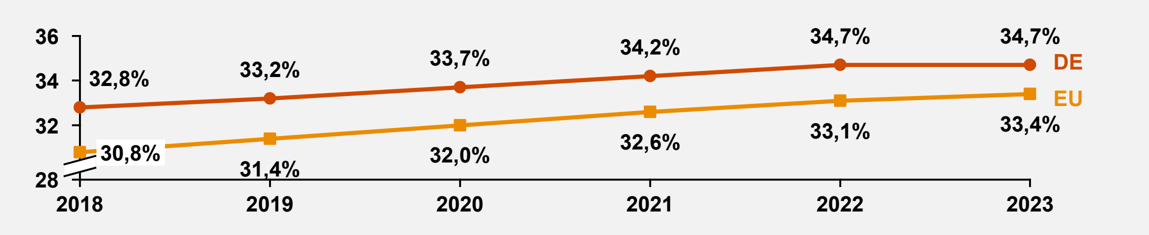
Average life expectancy at age 65 (2021)



Population aged 65+; in mil.; in 2022



Old-age dependency ratio; in %



Sources: Eurostat, Government of Germany, PwC analysis

Despite significant LTC benefits provision, affordability of LTC home is still challenging

Retirement Homes – Key Drivers (2/2)

Although the Government provides care benefits, the elderly are overburdened

Germany provides benefits according to the levels of assistance needed, based on the national assessment of individual's ability and need. These are determined based on the amount of care needed. This assistance, as shown on table to the right, is split into five levels, with level 1 not receiving benefits. Benefits increase with each level, and are split into at-home care, which range from 316 to 901 EUR; In-patient care, which range from 761 – 2.200.

Despite relatively large levels of benefits awarded to the elderly, the costs of LTC home are still above these insurance payments, which means that the elderly have to utilise their pensions to cover the remaining costs. For this reason we have performed the affordability assessment, showcased in the table to the right. Considering that the costs of LTC home vary according to the Federal state we have also taken into account gross pension per state (data on nett pension is not available). The assessment takes into account two levels, Level 5 care and Level 4 care, lower levels of support were not assessed as all states would be unaffordable, plus elderly belonging to categories 1 to 3 are less likely to choose permanent LTC and would rather stay at home.

At level 5 all elderly can support LTC payments, however it should be noted that gross-nett difference would most likely make some states unaffordable, PwC estimates that states where ratio is 0,8 or higher would fit this category. Hence, forcing elderly to use their savings, or receive support from family. At level 4 of support top 4 most expensive states are unaffordable for the elderly, as the affordability ratio is higher than 1. Furthermore, following 6 states are most likely unaffordable as the ratio is above 0,8.

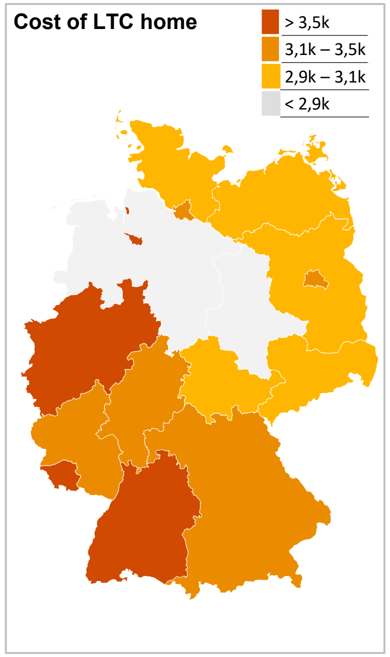
This issue is recognised by the Government who has instituted reforms in recent years to modernise LTCI by:

- **Increase funding** – 5 bn EUR annually
- **Improving and expanding benefit structure**
- **Expanding Services** – e.g. psychiatric care
- **Adding staff**
- **Improving coordination** – Improving role of municipalities in decision making

Care insurance benefits depending on care level; in 2023

Benefit Type	Level 2	Level 3	Level 4	Level 5
At-home care	316 EUR	545 EUR	728 EUR	901 EUR
In-patient care	761 EUR	1.432 EUR	1. 778 EUR	2.200 EUR

Affordability assessment (AA) – Avg. cost of LTC home and Avg. pension, 2023



Federal State	LTC cost	Gross Pension	AA lvl. 5	AA lvl. 4
Germany	3.248	1.623	0,65	0,91
Bremen	3.766	1.603	0,98	1,24
Saarland	3.671	1.741	0,84	1,09
Nordrhein-Westfalen	3.566	1.708	0,80	1,05
Baden-Württemberg	3.542	1.679	0,80	1,05
Bayern	3.286	1.617	0,67	0,93
Berlin	3.279	1.626	0,66	0,92
Rheinland-Pfalz	3.231	1.644	0,63	0,88
Hessen	3.217	1.678	0,61	0,86
Hamburg	3.187	1.674	0,59	0,84
Thüringen	3.055	1.509	0,57	0,85
Schleswig-Holstein	3.002	1.625	0,49	0,75
Sachsen	2.980	1.529	0,51	0,79
Brandenburg	2.945	1.572	0,47	0,74
Mecklenburg-Vorpommern	2.916	1.527	0,47	0,75
Niedersachsen	2.870	1.616	0,41	0,68
Sachsen-Anhalt	2.679	1.515	0,32	0,59

Sources: Eurostat, European Health Interview Survey, PwC analysis

Over the past years, a significant upward trend in the number of people in need of LTC care has been observed in Germany

Retirement Homes – Demand

The majority of people in need of LTC (84%) are receiving home-based care

In 2023, around 22,1% of the population in Germany was aged 65 years or above slightly higher than the EU average of 21,3%. This places Germany among 9 countries with the highest share of elderly, underscoring a substantial, undergoing trend in the German population ageing. According to Eurostat projections, Germany is expected to experience moderate growth in the number of population aged 65 years and over. By 2050, the number is projected to reach around 23M of the elderly or approximately 27,1% of the total population, representing an increase of around 23,0% from 2023 (18,7M).

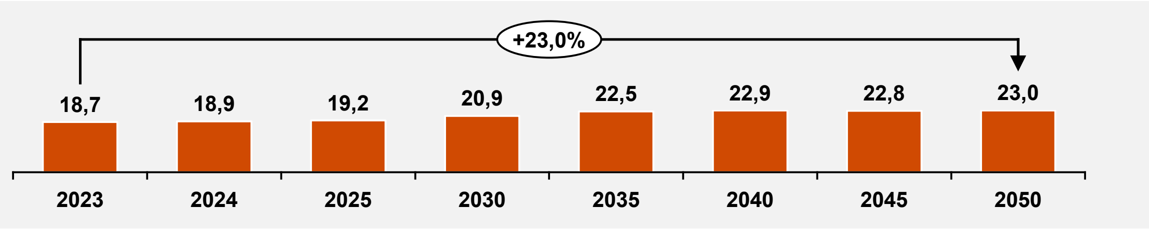
Between 2016 and 2023, the number of people in need of LTC in Germany has grown by CAGR 8,9%, indicating a substantial growth in demand for LTC services in the country. In 2023, there were ~5,7M people in need of LTC, representing a significant increase of 81,3% compared to 2016 (around 3,1M).

Government's projections indicate and increase in this trend, however at a slower pace. 9th German Ageing Report indicates that the number of people in need of LTC care will grow by CAGR 0,4% to a total of ~6,3M by 2050. This additional demand is projected to put additional strain on present LTC capacities.

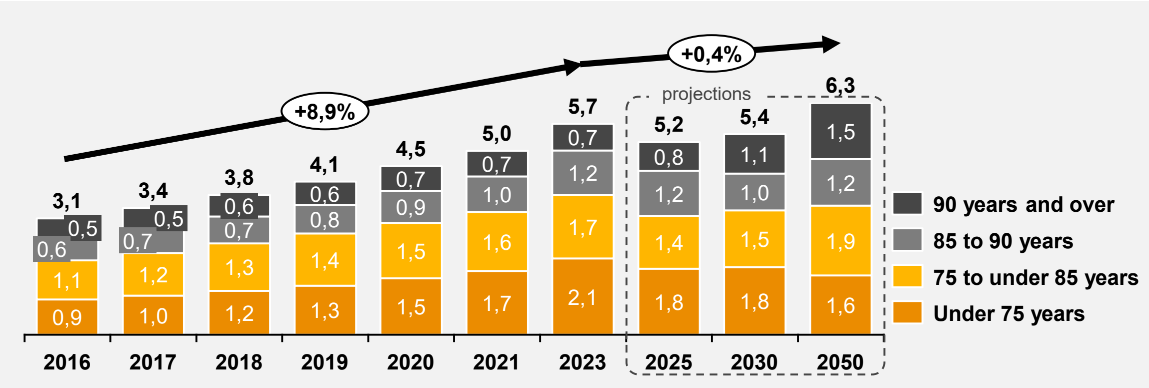
Furthermore, out of the total number of individuals receiving LTC-related services, around 21,1% of them opted for outpatient care, while ~16,0% of individuals opted for inpatient care in dedicated care facilities (continuous medical supervision). Out of these, ~97,2% of individuals opted for permanent care, while only 2,8% opted for short-term inpatient care. Importantly, around 84% of people in need of LTC in Germany are receiving home-based care, among other factors, indicating a cultural preference towards home care.

According to Eurostat, around 3,8M or 20,6% of people aged 65+ years in Germany live at risk of poverty or social exclusion, which translates to more than 1 in every 5 elderly experiencing risk of poverty. Over the past years, fluctuations in the risk of poverty rate have been observed across the EU, however, Germany has, in 2023, again exceeded the EU average (19,8%) in terms of the proportion of elderly at risk of poverty or social exclusion.

Baseline population projections for elderly aged 65 years or over; in mil.



People in need of LTC care; in mil.



Proportion of elderly at risk of poverty or social exclusion		2019	2020	2021	2022	2023
65+ years	Germany	18,8%	21,0%	20,5%	19,8%	20,6%
	EU-27	19,4%	20,0%	19,5%	20,1%	19,8%

Sources: Eurostat, Government of Germany, European Commission, PwC analysis

Germany showcases a slight growth in both number of facilities and number of beds, mainly driven by private players

Retirement Homes – Supply

Long-term care demand projections underscore the need for LTC provision

The number of residential nursing facilities in Germany has been growing by CAGR 2,3%, totalling 16,5k facilities in 2021. The substantial y-o-y increase is primarily driven by growth in the number of private facilities (CAGR of 2,2%) and non-profit facilities (CAGR of 2,5%), while public facilities stagnated.

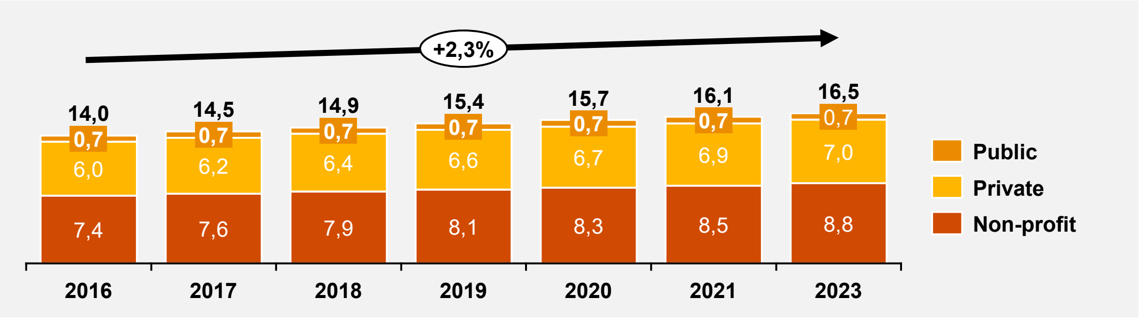
Moreover, a slightly slower y-o-y growth of around 0,8% has been observed in the number of residential nursing places compared to the growth indicated in the number of facilities. More than half (53,2%) of all residential care places in Germany are owned by non-profit organizations, an equivalent to around 524k places, while there are only 5,7% of all residential care places publicly owned (56k). Furthermore, in Germany, the distribution of residential nursing places, among public, non-profit and private for-profit entities, reflects the ownership structure of the residential nursing care facilities.

In Germany, long-term care staff is divided into two groups (staff of out-patient care service providers and staff of in-patient care facilities). The majority of those employed in long-term care work in in-patient care facilities. In 2023, around 817,7k caretakers have been employed in residential care. In the past five years the number has increased by 19,3% from 685,4k in 2013, indicating a staff expansion of around 132,3k caretakers.

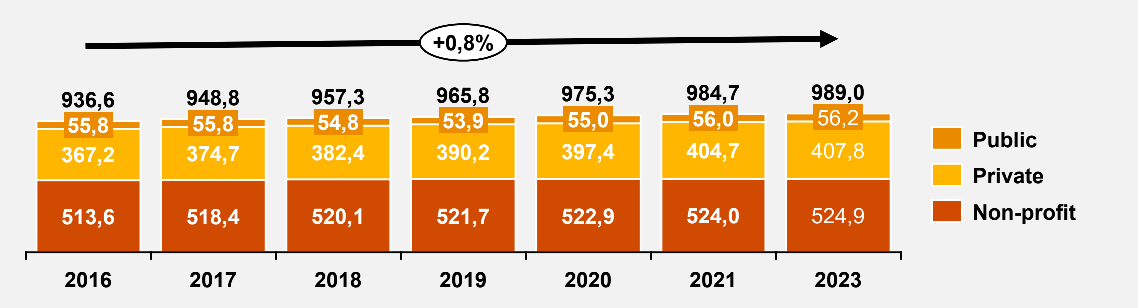
Moreover, around 446,4k caretakers have been employed in services providing out-patient care for seniors. In the five years decade, the number of home-care service staff has increased by 39,5% from 320,1 in 2013.

Over the past years (2016-2023), a substantially higher y-o-y growth rate in the number of staff in the respect staff group has been observed, with the number of caretakers in out-patient services growing by 3,5%, compared to in-patient care staff growing by 1,7%. However, research suggests a persistent shortage in the number of LTC caretakers exist, which is unlikely to be closed down due to low graduates in nursing care.

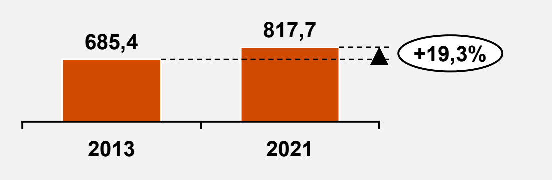
In-patient nursing care facilities in Germany by ownership; in ths.



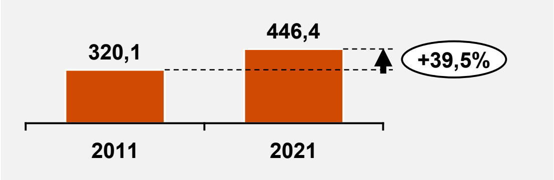
In-patient nursing care places in Germany by ownership; in ths.



In-Patient care staff; in ths.



Out-Patient service staff; in ths.



Sources: Eurostat, Government of Germany, DEStatis, PwC analysis