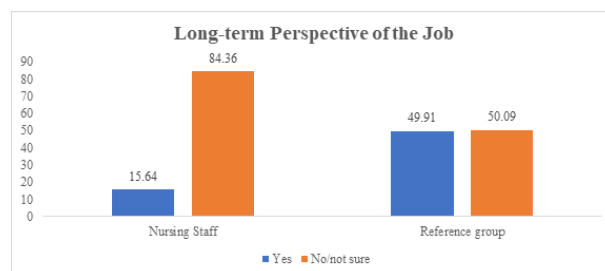


Monitoring Shifts in Professionals in the Health Care Sector

Background. Various sectors are facing a shortage of skilled workers, including the healthcare sector. A shortage of up to 35% is expected by 2035, which corresponds to around 1.8 million missing employees just in the healthcare sector. Some of the factors behind this are individual human circumstances, while others can be reduced to two core factors: on the one hand, the current demographic trends indicate that the number of available workers for the healthcare sector declines; and, on the other hand, there is an increase in the need for healthcare facilities due to an ageing society. In the healthcare sector in particular, there is a high workload due to strenuous physical exertion and mental strain on staff. This often plays a role in changing jobs, reducing hours or even leaving the profession.



Proportion of professionals answering in a survey regarding whether they believe that they will stay in the profession long-term, nursing profession vs. reference group.

Challenge. In order to better meet this uncertain situation, a forecast of “what is to come” can be enormously beneficial. Such a forecast will answer the following: what will the demand be for specialists in the healthcare sector in 5 years, 10 years, etc.? What demand for services and the associated personnel will there be in the same timeframes? There is a lot of data feeding into such a forecast: the current length of time spent in employment, the current average retirement age, current full-time employment and part-time employment, female staff and male staff, as well as the use of parental leave and single-parent employees. Additional factors could include the following: the impact of the pandemic and any foreseeable future pandemics, care facilities at locations, pay developments, the impact of reforms or legal efforts.

Vision. A data model that can show the demand for skilled workers and the need for skilled workers per year in the future is a valuable asset. This demand will also vary between regions and especially for health care, a good cover of services is important. Thus, we envision both a temporal and a spacial (across Germany) forecast, pertaining to multiple professions within the health care sector.

Partner Description. This project is supervised together with employees from the Deutsche Krankenhausgesellschaft (DKG). The DKG is formally a non-profit "eingetragener Verein". They represent and bind together all hospitals in Germany, working as a lobby group in the interest of hospitals. However, the DKG also has obligations towards the German ministry of health, in particular pertaining to gathering, processing and forwarding data from hospitals. The headquarters of the DKG are in Berlin near S Tiergarten.

Partner Contribution. Thanks to their numerous obligations and cooperations, the DKG has a wealth of data about health care in Germany, some of which we will be able to use for this project. Furthermore, they have the domain knowledge about the project content to ascertain which directions of work are worthwhile, to judge results according to their importance and to help with medical / health related jargon.

Our Contribution. The research group will work closely with you on the project and will provide expertise in algorithm engineering and processing of large amounts of data. We will help you develop theoretical models to investigate the provided data and quality of solution approaches. As in previous bachelor and master projects of our group, we plan to write a joint scientific publication about our research findings. For that and for your bachelor theses, we will offer a workshop on scientific writing in March.

Your Contribution. In your work as a team, you will develop and customize a bundle of algorithms for solving the problems at hand. For exploring industrial-size datasets, you will create the necessary code infrastructure and efficient algorithms. Besides team experience in an industrial context, you will learn about efficient data processing and the practical use of algorithms, geometry, and other related fields.

Supervisors and project partners.



Prof. Dr. Tobias Friedrich
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