

RESEARCH ARTICLE

Can the unemployed be trained to care for the elderly? The effects of subsidized training in elderly care

Christine Dauth  | Julia Lang

Active Labour Market Policies and
Integration, Institute for Employment
Research (IAB), Nuremberg, Germany

Correspondence

Christine Dauth, Institute for
Employment Research (IAB),
Regensburger Str. 104, 90478 Nuremberg,
Germany.
Email: christine.dauth@iab.de

Abstract

Demographic change has increased the need for elderly care. Training unemployed workers might be one way to increase the supply of elderly care nurses. This study analyzes the effectiveness of subsidized training for unemployed individuals in the elderly care professions in Germany over 11.5 years. We find that short further training and long retraining courses significantly increase workers' long-term employment. As approximately 25% to 50% of trained nurses have permanent jobs in the care sector, we estimate that approximately 5% of all employed nurses are formerly trained unemployed workers.

KEYWORDS

elderly care, further training, health care, labor supply, program evaluation

JEL CLASSIFICATION

I11; I18; J24; J68

1 | INTRODUCTION

In many countries, demographic change has increased the need for skilled labor in the field of elderly care. In Organization for Economic Cooperation and Development [OECD] countries, for example, the share of the population aged 65 years and older is expected to double and amount to 27% by 2050 (OECD, 2015). Consequently, the number of older people in need of long-term care will increase.

Currently, informal caregivers, such as family members and friends, are the most important home care providers (Bettio & Verashchagina, 2010). However, delayed childbearing, changes in family structures, and the increasing labor market participation of women (who perform the majority of informal care) may increase the future demand for formal care (Lilly, Laporte, & Coyte, 2010; Van Houtven & Norton, 2004). By contrast, demographic change also affects the formal care supply side because the total labor force is declining in many countries (European Commission, 2015). Together, these trends imply a shortage of skilled workers in the elderly care sector.

This problem intensifies through tough working conditions and low wages in the sector. Care professions are not popular among school graduates, and job turnover is high (Colombo, Llena-Nozal, Mercier, & Tjadens, 2011a). Consequently, governments must choose among different strategies to address potential skill shortages in the care sector. Many countries recruit immigrants as caregivers, particularly the United States, Australia (Colombo et al., 2011a), and many southern European countries (Simonazzi, 2009). In addition to migrants, Germany critically supplements the insufficient number of care workers with trained unemployed workers (Bundesagentur für Arbeit, 2015).

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In this paper, we analyze the extent to which subsidized elderly care training is successful in bringing unemployed workers into elderly care employment. We use German administrative data on training participants in the field of elderly care who started a training course between 2003 and 2015. A back-of-the-envelope estimation reveals how many workers this type of training actually contributed to the overall pool of care nurses between 2003 and 2015.

The German Federal Employment Agency (FEA) finances training programs in elderly care professions for unemployed workers if it is necessary to reintegrate them into the labor market. On the one hand, unemployed workers can participate in retraining, which takes 3 years and yields a vocational degree as an elderly care nurse. On the other hand, unemployed workers can participate in shorter further training, which provides basic care knowledge for workers without elderly care work experience, qualifies them as semiskilled elderly care assistants, or enhances the existing skills of workers with elderly care work experience.

The German case is interesting for two reasons. First, elderly caregiving, with almost 15% of all courses in 2015, is the most important target occupation for subsidized retraining in Germany (Statistik der Bundesagentur für Arbeit, 2016). Second, Germany will have the second highest share of people who are older than 80 years in the OECD by 2050 (OECD, 2013). Studying the German case might provide important insights for other countries that are faced with aging societies that thus far have predominantly relied on immigration to meet the demand for elderly caregiving.

2 | LITERATURE REVIEW AND INSTITUTIONAL BACKGROUND ON ELDERLY CARE

2.1 | Related literature

Solving nursing shortages has been on the political agenda for more than 50 years, particularly in the United States (Yett, 1966). The literature documents different potential solutions to this problem. Some countries pursue active immigration strategies to recruit nurses from abroad (Colombo, Llena-Nozal, Mercier, & Tjadens, 2011b). Thus far, there are four studies of the U.S. labor market that discuss the labor market effects of importing foreign nurses on native registered nurses. The existing evidence is mixed. In the short term, immigrant nurses successfully increase the overall labor supply of nurses (Kaestner & Kaushal, 2012) or leave it unaffected (Kalist, Spurr, & Wada, 2010). However, over a 10-year period, foreign nurses displace native nurses. Cortés and Pan (2014) show that for every foreign nurse that migrates to a city, one to two fewer native nurses are employed in U.S. cities. In some states, an increasing number of foreign nurses decreases the number of native nurses who try to become licensed as registered nurse. At the same time, the inflow of migrant nurses appears to decrease the earnings of native nurses (Kaestner & Kaushal, 2012; Schumacher, 2011).

Such an impact could be counter-effective as wages of nurses are generally low, and increasing the wages of nurses may be another way to attract new workers and retain existing nurses. The latest evidence indicates that nurses' wage elasticities are positive and high because increasing wages affects workers' decisions to enter or exit the nursing profession (Hanel, Kalb, & Scott, 2014; Schweri & Hartog, 2017). However, previous research that focuses on nurses' working hours has documented results that are more modest. It shows that increasing wages does not increase nurses' working hours and that their labor supply is therefore rather unresponsive to wage changes (e.g., Di Tommaso, Strøm, & Sæther, 2009; Shields, 2004, for an overview).

Focusing on the inactive workers of a population might therefore be another way to increase the supply of nurses. Germany has identified the further training of unemployed workers as an important strategy to increase the labor supply of elderly care nurses (Bundesagentur für Arbeit, 2015).

Many empirical studies analyze the effects of training for the unemployed (Card, Kluge, & Weber, 2010, 2018), but only a few studies explicitly focus on specific occupations. Osikominu (2013) shows that the effects of training on employment and earnings can differ by participants' occupations prior to unemployment. Kruppe and Lang (2018) analyze vocational retraining for the unemployed by targeted occupation. They show that health care occupations—which include elderly care nurses—are among the professions with the highest employment effects.

Our study differs in various aspects. First, we are the first to evaluate if training unemployed workers as certified nurses is successful in bringing and retaining workers in the elderly care sector. Thus, we can assess whether the training program contributes to reducing the gap between labor supply and demand in the elderly care sector. Second, we consider not only retraining that educates unemployed workers as certified nurses but also further training that, for example, can qualify unemployed workers to be elderly care assistants. Analyzing retraining and further training allows us to directly compare the relative effectiveness of long and costly versus short and inexpensive elderly care training.

Third, presenting the results over 11.5 years, we can analyze the long-term effectiveness and investigate whether employment after training is sustainable.

2.2 | Institutional background

In 2013, approximately 55% of the elderly care workforce in Germany were qualified nurses, and 45% were low-skilled workers, for example, elderly care assistants (Bundesagentur für Arbeit, 2015). Elderly care nurses perform many different duties such as helping patients with their daily needs (i.e., bathing, dressing, and eating), encouraging physical or mental activity, or administering medication. Elderly care assistants (and other low-skilled workers) support them in these activities. Additionally, elderly care nurses perform administrative and organizational tasks and bear more responsibility. Consequently, the vocational training of elderly care nurses lasts longer, and they receive higher wages.

The fact that there are 37 unemployed elderly care nurses per 100 vacancies underlines a shortage of skilled labor in the elderly care sector. The German FEA reacted by shifting resources in recent years to train skilled nurses. In fact, in the school year of 2013/2014, one out of four trained elderly care nurses was a retrained unemployed worker (Bundesagentur für Arbeit, 2015). Generally, unemployed workers qualify for the training subsidy, if it is necessary to equip them with a vocational qualification to reintegrate them into the labor market.

Some unemployed people may just need some *further training*, which typically takes several weeks or months and usually takes place in classrooms. Further training courses that aim to improve or extend existing skills (e.g., human resource development or computer software) target individuals with work experience in the sector. Further training courses that target workers without work experience in elderly care comprise, for example, 2-day courses that teach basic knowledge in elderly care or courses that take approximately 1 year and qualify workers as elderly care assistants.

Some people who have never completed any vocational training or who are no longer able to work in their original occupation may want to obtain a (new) vocational degree to improve their employment chances. *Retraining* in elderly care normally takes 3 years and combines classroom and on-the-job periods; it eventually entitles participants to work as qualified elderly care nurses. Retraining is open to both individuals who have never worked in the elderly care sector and individuals with some work experience in elderly care but without a vocational degree.

Data S2 provides detailed information on training enrollment in practice. Essentially, the caseworker's assessment of the need for a specific type of training, the worker's preference, and the training budget of the local employment agency determine whether a worker enters a specific course.

3 | DATA

We exploit administrative records provided by the Institute for Employment Research of the German FEA. These data comprise information on all unemployed workers who register at least once with the FEA for the receipt of benefits, job searches, and participation in active labor market policy programs. Moreover, the data include information on the date and duration of employment, job search/unemployment, and program participation, as well as individual and job characteristics. Because all of this information is process-generated, it has daily precision and is highly reliable (Dorner, Heinig, Jacobebbinghaus, & Seth, 2010; Jacobebbinghaus & Seth, 2007).

3.1 | Sample restriction

For the analysis, we identify individuals who register as unemployed and job seeking for at least 1 day. We concentrate on unemployed workers in the unemployment insurance system who are relatively closely attached to the labor market. Treated workers enter one of the two types of subsidized training. We focus only on the first participation in subsidized elderly care training within the randomly chosen unemployment spell.

Potential comparison workers do not enter retraining or further training in elderly care until the moment of potential treatment (see more details below). If they have more than one unemployment spell that corresponds to our definition, we randomly choose one spell. We restrict the sample of potential comparison observations to the months that workers spend openly unemployed. That is, we allow that a worker has already participated in another kind of short labor market program during the unemployment spell but is unemployed and not involved in any kind of program activity at the moment of potential participation.

TABLE 1 Treatment characteristics of the participants

Variable	All	Retraining	Further training
Women (%)	84	74	88
Enrollment length (days)	397	844	185
Duration from UE to enrollment (days)	100	100	99
UE duration (days)	555	964	362
Training successfully completed (%)	90	85	92
Training drop out (%)	10	15	8
Training examination failed (%)	0	0	0
Prior to UE: employment (%)	54	56	53
Prior to UE: education (%)	5	9	3
Prior to UE: in the labor force (%)	2	2	2
Prior to UE: not in the labor force (%)	20	15	22
Prior to UE: participation in ALMP (%)	20	19	20
Ever worked in elderly care occupation before (%)	18	20	17
Ever worked in related occupation before (%)	19	22	18
Always worked in different occupation(s) (%)	63	58	65
N	44,486	14,299	30,187

Note. Related occupations comprise nurses, midwives, nursing assistants, nursery teachers, and child nurses. ALMP: active labor market policy programs; UE: unemployment.

Source: IEB V12.01.00–160927. Own calculations.

We restrict the sample to workers who became unemployed between January 2003 and December 2015 and to participants who entered subsidized training in this period. We further straighten the sample by dropping workers outside the age range of 20 to 60 years and for whom we lack information on the type of vocational degree, schooling, and marital status.¹

The outcome of interest is employment liable to social security contributions, which we measure every 30 days after the moment of potential treatment. In Table S1, we list sample statistics and information on the independent variables.

3.2 | Treatment characteristics

Our sample contains approximately 45,000 training participants for the entire observation period. Not surprisingly, the majority of the participants (84%) are female. Workers are more likely to participate in further training (68%) than retraining (32%).

Table 1 shows that enrollment in retraining lasts on average 844 days and is much shorter for further training with 185 days. Therefore, dropout rates are generally lower. More than half of the participants were employed before registering as unemployed and job seeking. Approximately 20% were previously out of the labor force; another 20% had previously participated in another program of active labor market policy. Approximately two thirds of all individuals never worked in any care occupation before they became unemployed.² This finding implies that subsidized training may indeed bring “new” workers to the care industry.

4 | EMPIRICAL APPROACH

4.1 | Multiple treatments in a dynamic setting

To identify the causal impacts of training in the elderly care sector, we choose the potential outcome approach (Roy, 1951; Rubin, 1974) and rely on propensity score matching (Rosenbaum & Rubin, 1983). We denote the potential outcome of participating in further training (*FT*) as Y^{FT} and in retraining (*R*) as Y^R whereas Y^0 represents the outcome

¹We do not condition on transitions from employment to unemployment but also allow for transitions from outside the labor market to unemployment, and we control for the labor market status immediately before unemployment registration. A robustness check that excludes workers who come from nonparticipation and who register as unemployed yields very similar qualitative and quantitative results (see Figure S1).

²We also know if a worker obtained a vocational degree, but we do not know the occupation of this degree.

without any participation in an elderly care program. Per unemployed worker, we observe one of these three outcomes. We estimate two different sets of average treatment effects on the treated (ATT):

1. The effect of treatment versus searching. This is the ATT of receiving treatment $a = FT, R$ against nonparticipation $b = 0$. As Biewen, Fitzenberger, Osikominu, and Paul (2014) note, this setting reflects the decision-making process of caseworkers and unemployed workers of either waiting to see if a job search is successful or starting further training or retraining.
2. The differential effect of further training and retraining. This is the ATT of receiving treatment a against treatment b , with $a \neq b \neq 0$. This approach analyzes whether the participants in retraining would have performed differently had they chosen further training and vice versa, conditional on previous unemployment duration.

We divide the unemployment spell into monthly strata. As most workers receive treatment during the first months of unemployment, we focus on the first 12 months. Let $t = 1, \dots, 12$ denote the month of unemployment in which an individual starts treatment a with $a = FT, R$. $\tau = 0, \dots, 138$ denotes the months since the beginning of potential treatment a , such that $Y^a(t, \tau)$ is the potential outcome at moment $(t + \tau)$ for treatment a starting in month t . $Y^b(t, \tau)$ is the potential outcome for treatment b (with $b = 0, FT, R$) starting in month t .

The ATT of treatment a (with $a \in \{FT, R\}$) against alternative treatment b (with $b \in \{0, FT, R\}$ and $a \neq b$) is therefore

$$ATT_t(a, b, \tau) = E(Y_t^a(t + \tau) - Y_t^b(t + \tau) \mid T^0 = t, D_t = a).$$

T^0 is elapsed unemployment duration, and $D_t \in \{0, FT, R\}$ is the treatment status in month t . Thus, for treatment a starting in period t , we require that the potential comparison individuals who receive treatment b have spent the same amount of time in unemployment as of period t and receive treatment in the same month as the treated individual.

We chose this dynamic framework because a static framework would neglect the endogenous relationship between elapsed unemployment duration and the probability to be treated (Fredriksson & Johansson, 2008; Sianesi, 2004, 2008). However, under the dynamic approach, comparison workers can be future participants, which affects their future outcomes and attenuates the treatment effect. Therefore, our effect of training versus potential training some time later is not what we are primarily interested in. About 21% (17) of the weighted control observations in the retraining (further training) sample will later participate in some type of elderly care training themselves. This implies that we probably underestimate the actual effects of training participation versus nonparticipation if we assume positive program effects.

For the analyses, we report the estimates as averages over all 12 monthly subsamples and ensure common support throughout all specifications. We chose nearest neighbor matching with 20 neighbors and replacement and a caliper bandwidth of 0.01 by using the Stata module psmatch2 (Leuven & Sianesi, 2015). Data S3 provides detailed information on the matching approach and the estimation of the standard errors.

4.2 | Assumptions

We assume that potential outcomes are independent across individuals. This stable unit treatment value assumption excludes spillover and general equilibrium effects. The latter is particularly important in our context because we want to quantify how many workers subsidized elderly care training contributes to elderly care employment.

Two arguments indicate that the stable unit treatment value assumption holds in our setting. First, we focus on workers with short unemployment durations. It is unlikely that during this brief period these workers have formed social networks with other unemployed workers, who encourage or discourage one another to take up elderly care training. This limits the threat of spillover effects. Second, the elderly care sector in Germany is marked by a shortage of skilled workers. Therefore, it absorbs all qualified nurses who apply for a job in this field. However, due to the shortage of skilled nurses, nursing homes must also rely on unskilled or semiskilled elderly care workers to conduct the core tasks of elderly care. Therefore, the elderly care sector also absorbs these workers, and it is unlikely that subsidized workers crowd out unsubsidized workers.

The dynamic conditional mean assumption implies that conditional on previous unemployment T^0 and observable characteristics X , the incidence, the type, and timing of treatment leave the potential outcome unaffected:

$$E(Y_t^b(t + \tau) \mid T^0 = t, D_t = a, X) = E(Y_t^b(t + \tau) \mid T^0 = t, D_t = b, X).$$

Applying propensity score matching, we replace the vector of observable characteristics X with the probability of treatment $P(X)$. If we consider all determinants of X that affect the treatment status and the potential outcomes for the estimation of the propensity scores, the incidence and type of treatment in a given month of unemployment are as good as random, and the treatment estimates are valid.

As mentioned in Section 2.2, the worker's preference, the caseworker's assessment of the need for a specific type of training, and the training budget of the local employment agency determine whether a worker enters retraining or further training. If the remaining budget is low, caseworkers are more likely to hand out vouchers for shorter further training courses, which are less costly. This restriction does not directly affect the outcome but rather the incidence and choice of training. Moreover, workers' preferences are reflected in questions such as the following: Is retraining that lasts 2 to 3 years going to pay off (at my age)? Am I (still) willing and able to study? Am I certain that elderly care is the field that I want to work in in the long term? Caseworkers will consider similar factors concerning motivation, labor market prospects, and the personal life situation of the unemployed workers.

Consequently, age, education, marital status, young children in the household, and the previous labor market career—all observable factors that are considered in our analysis—simultaneously drive the worker and caseworker's preference for retraining or further training and the outcome. Furthermore, we include detailed information on the last job and employer and the labor market career prior to unemployment, which should also capture usually unobserved personality traits (Caliendo, Künn, & Weißenberger, 2016; Caliendo, Mahlstedt, & Mitnik, 2017). For more details on the control variables, see Table S1.

The no-anticipation assumption requires that anticipated training participation must not affect a job seeker's behavior. Our setting probably violates this assumption because workers receive training vouchers that they can redeem for training within 3 months. Consequently, they can react to future program participation during this period, for example, by reducing job search activities.

In the case of further training, it is, nevertheless, quite possible that the assumption holds. Further training courses start constantly throughout the year, and caseworkers award the vouchers on short notice. Moreover, workers who participate early in their unemployment spell have less time to anticipate potential treatment than workers who participate later in their unemployment spell. Figure S2 shows that the employment effects do not differ for workers who start further training in the first 3 months of their unemployment spell and workers who start later in their unemployment spell. Thus, potential anticipation does not affect the long-term program effectiveness of further training.

No anticipation is more problematic in the case of retraining, which usually starts on March 1 or September 1. Thus, some workers may react to retraining participation scheduled several weeks or months in the future by adjusting their job search activities. We conduct the same robustness check as for further training. Figure S2 shows that the long-term effects of retraining for the participants who start treatment within the first 3 months of unemployment are approximately 5 percentage points lower than for the participants who start treatment after being unemployed for at least 3 months. The employment effects for workers who participate early in the employment spell are more likely to be unbiased. Thus, comparing these estimates to our baseline estimates on retraining reveals that we slightly overestimate the long-term employment effects by 2 percentage points on average.

5 | CAUSAL ESTIMATES OF TRAINING IMPACTS

5.1 | Baseline estimates for employment

Figure 1 shows the employment rates for the participants and their matched nonparticipants in retraining and further training and the ATT. The horizontal axis indicates the time before and after the treatment start in months.

Before the treatment start, the employment rates are identical, and the depicted employment rates for the treated and control groups overlap. This result indicates that propensity score matching worked and that we have well-balanced treatment and control groups.³

³Tables S3 and S4 show the results of t tests for the equal mean values of all covariates between the treated and control groups after matching. Table S5 presents further indicators for the matching quality per month of unemployment duration. This table also includes the number of treated observations that we drop because they lie outside the common support. We find adequate control observations for nearly all treated workers. Among the retraining participants, we discard 37 workers, and among the further training participants, we discard 28 workers.

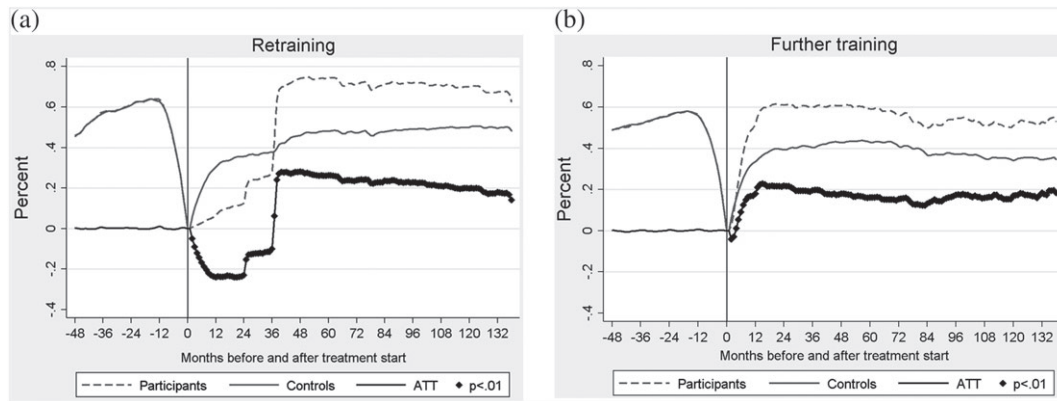


FIGURE 1 Employment effects of retraining and further training for workers. Source: IEB V12.01.00–160927. Own calculations. $p < 0.01$ indicates significance at 1% level

We find that retraining at first entails strong lock-in effects but has huge positive employment effects in the long run.⁴ One year after the program start, the participants have over 24 percentage points lower employment rates than similar nonparticipants. After the lock-in period of 3 years—the common duration for elderly care retraining—the participants' employment rates increase sharply, and we find strong effects of up to 28 percentage points. Eleven years after the treatment start, the ATT still amounts to approximately 18 percentage points.⁵

For further training, the most striking difference with retraining is a much shorter and weaker lock-in effect (approximately 4 months) in addition to overall lower ATTs. After the lock-in period, the treatment effects add up to 23 percentage points and remain at approximately 18 percentage points until 11.5 years after the treatment start.

We know that further training covers a variety of different courses. Approximately 10% of the participants perform further training with a planned duration of at least 360 days that likely qualifies them as elderly care assistants. Approximately 90% participate in shorter further training that either provides basic care skills or enhances existing skills. Figure S6 shows that the employment rates are higher and more stable for the participants with a planned duration of at least 360 days. Ten years after the treatment start, participation improves their employment rates by 23 percentage points. Thus, within the group of further training participants, those who plan to qualify as elderly care assistants drive the positive employment effects upwards.

In the next step, we evaluate if the long-run employment gains actually translate into enduring employment in the elderly care sector. The variable that we have used thus far to identify elderly care training participants is based on the four-digit level of occupations. However, we can identify employment outcomes by occupation only at the three-digit level. Therefore, we cannot exactly delimit the outcome variable “elderly care employment.” However, by using additional data sources, we can infer that elderly caregiving constitutes 75% to 85% of the three-digit elderly care employment variable. The remaining 15% to 25% comprise sanitation inspectors, marriage counselors, and social workers.

Figure 2 shows that approximately 50% (27) of all workers who participated in retraining (further training) are still employed in an elderly care profession after 10 years. Conditional on employment, this implies that more than 70% of all reemployed retraining participants and approximately 50% of all reemployed further training participants work in the care sector. Thus, although both kinds of training have strong positive effects, retraining brings twice as many unemployed workers into elderly caregiving as further training courses.⁶

Moreover, Figure S7 indicates that workers who are new to this particular occupation (63% of the sample) primarily drive the positive effects on employment. This result suggests that it is possible to train unemployed individuals from other occupations to work successfully in the elderly care sector.

⁴Figures S3 and S4 report more detailed analyses by the year of treatment start (2003–2005, 2006–2008, 2009–2012, and 2013–2015). The overall patterns remain stable over time, but employment effects are slightly larger for participants in the years 2003–2005. We attribute this to a changing composition of participants.

⁵Approximately 85% of all participants are female, but the effects are very similar for men and women as Figure S5 shows.

⁶Table S6 shows that further important occupations trained workers end up in, such as nurses and midwives, nursing assistants, or child nurses, also relate to caregiving.

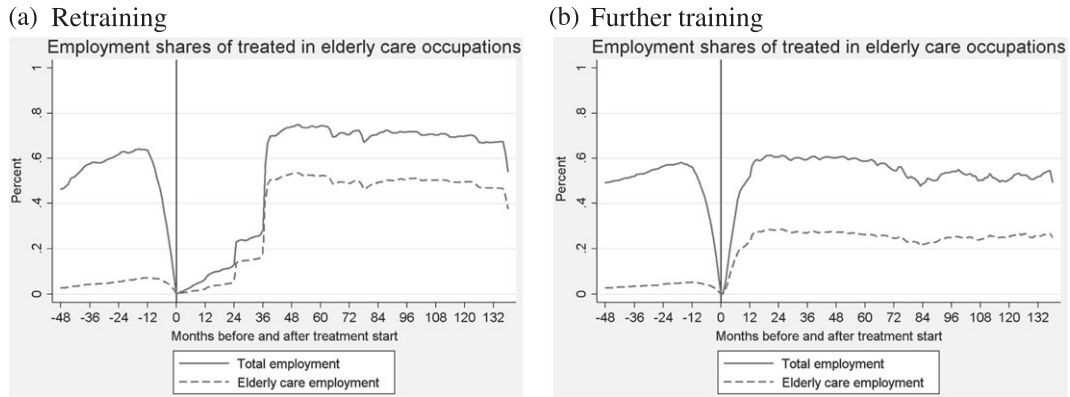


FIGURE 2 Employment shares of the program participants in care occupations. Source: IEB V12.01.00–160927. Own calculations

5.2 | Implications for the government

Thus far, we found out that subsidized further training and retraining enduringly bring unemployed workers back to work. However, what are the programs' implications from the government's perspective? As subsidized further training seems very effective, is it necessary to subsidize costly retraining? Moreover, how many workers did subsidized training contribute to the stock of elderly care workers today? This section provides answers to these questions.

5.2.1 | The differential effects of further training and retraining

Our results suggest that participation in retraining is more beneficial than participation in further training in the medium term, but the employment effects appear to converge in the long run. However, the retraining participants and further training participants are differently employable and vary in their characteristics (see Table S2). Therefore, it is not necessarily true that people who receive further training would have fared better if they had participated in retraining to become an elderly care nurse and vice versa. For workers who have a de facto choice between retraining that yields a vocational degree and less expensive further training that provides basic care knowledge (workers without work experience in elderly care), we estimate differential treatment effects.⁷

As retraining and further training participants differ in their characteristics, it is crucial to ensure common support in the treatment probabilities. We discard approximately 20% (1,869 observations) of all retraining participants to compare retraining versus further training, and approximately 24% (4,318 observations) of all further training participants to compare further training versus retraining (see Table S5). Thus, the differential effects are based on a smaller subsample, which limits the external validity.

Figure 3a shows the effects for participating in elderly care retraining instead of further training for retraining participants. As retraining lasts on average almost 3 years and further training lasts approximately 6 months, there are strong initial lock-in effects. After 3 years, the retraining participants benefit in the employment rates. The effect becomes statistically insignificant after approximately 7.5 years. Thus, shorter and less costly further training courses yield almost the same level of employment stability in the long term. However, only a small group of workers drives the long-term effects. Thus, the effects of retraining versus further training might remain positive in the long term had we also had a longer outcome period for the later cohorts. As only 586 of 13,557 of the matched further training participants (approximately 4%) start retraining some time later, statistically insignificant long-term effects are unlikely due to further training participants obtaining a retraining degree later.

Figure 3b shows the results for the opposite scenario. For further training participants, further training generates more beneficial effects than retraining during the lock-in period of 3 years. In the medium run, they lose compared with hypothetical retraining. The negative employment effects become insignificant after 5.5 years. However, as above, the

⁷Workers already holding a vocational degree in elderly caregiving cannot choose retraining.

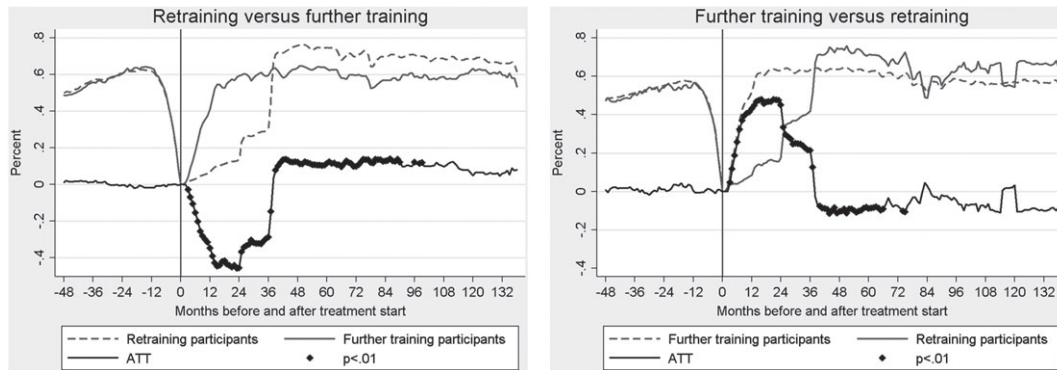


FIGURE 3 Differential effects of retraining and further training on employment. Source: IEB V12.01.00–160927. Own calculations. $p < 0.01$ indicates significance at 1% level

same problems apply (weaker common support, lower external validity, and a small number of participants to identify the long-term effects).

Although these results should be treated cautiously given the problems discussed above, from the perspective of a government that has the objective to bring the unemployed as fast as possible into effective employment, further training courses might initially appear to be more attractive than retraining. These courses have much shorter lock-in periods, are less expensive, and appear to yield the same level of re-employment in the long run.

However, from the perspective of a government with the objective to increase labor supply in the elderly care sector, the results are not as conclusive. The share of individuals who actually work in the elderly care sector is much higher for the retraining participants than for the further training participants (see Figure 2 and Table S6).⁸ Thus, the retraining participants contribute more strongly to the elderly care workforce. Finally, they might be more productive than the further training participants.

5.2.2 | How much did the program contribute to the stock of elderly care workers in 2015?

Between 2003 and 2015, approximately 57,000 workers entered retraining, and approximately 47,000 workers entered further training courses (Table 2). During the same period, the stock of elderly caregivers increased steadily; this trend was only interrupted by statistical corrections due to a break in the classification of occupations. In 2015, approximately 530,000 employees worked in this industry. By using our estimates, we can roughly calculate the number of workers that subsidized training contributed to the overall stock of workers in elderly care in 2015, the most current year in our analyses.⁹

First, we calculate for each year the number of workers who started participation in both programs and still work in the elderly care sector in 2015. For example, in 2010, 5,649 workers started subsidized retraining in elderly caregiving. We find that 66 months later, 2,768 workers (49%) still work in the elderly care sector. The last column of Table 2 reveals that approximately 18,000 retraining and 12,000 further training participants still have elderly care jobs in 2015. Thus, approximately 5% of the overall stock of elderly caregiving employees in 2015 have received subsidized further training or retraining in elderly care during the previous 12 years. The majority of the participants who entered retraining in 2013 or later still receive training in 2015. Thus, their contribution to the elderly care workforce is still small in 2015 but will increase in the following years.

The numbers that we provide come from a rough back-of-the-envelope calculation. This is due to several data restrictions. First, one restriction comes from a break in the classification of occupations in 2011 (for details, see Paulus

⁸For both types of training, the shares of workers in the elderly care sector for the subsample are very similar to the shares that are reported for the full sample in Section 5.1.

⁹Table 2 neglects the unemployed participants who are in the welfare system because our analyses are restricted to unemployed workers in the unemployment insurance system.

TABLE 2 Stock of workers, program entries, and the contribution of subsidized training to the stock of caregiving employees in 2015

Variable	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total in 2015
Stock of workers in the care sector ^a	404,064	411,034	421,376	439,292	463,728	492,606	531,157	566,167	572,723	460,486	486,554	507,651	532,213	532,213
Worker inflow to retraining	11,743	6,975	1,249	744	1,161	1,327	4,077	5,649	3,160	3,859	5,855	5,728	5,427	56,954
Estimated share of retraining participants in the care sector in 2015	0.35	0.37	0.47	0.49	0.5	0.5	0.46	0.49	0.52	0.5	0.15	0.04	0.01	
Absolute number of retraining participants in the care sector in 2015	4,110	2,581	587	365	581	664	1,875	2,768	1,643	1,968	878	229	54	18,303
Worker inflow to further training	861	874	308	791	1,600	3,311	8,345	8,891	5,507	3,399	4,804	4,319	4,354	47,364
Estimated share of further training participants in the care sector in 2015	0.16	0.25	0.27	0.26	0.25	0.23	0.23	0.26	0.27	0.27	0.27	0.28	0.16	
Absolute number of further training participants in the care sector in 2015	138	219	83	206	400	762	1,919	2,312	1,487	918	1,297	1,209	697	11,645

Note. There was a break in the classification of occupations in 2011. Therefore, the data from 2003 to 2011 are based on the classification KIdB88, and the data from 2012 to 2015 are based on classification KIdB2010.

Sources: Worker inflows to retraining/further training and stock of workers in the care sector: Statistics of the Federal Employment Agency, May 2018; Estimations: IEB V12.01.00–160927.

^aData as of 12/31 of each year, except for 2011 (data as of 6/30).

& Matthes, 2013).¹⁰ Due to this break, the stock of elderly care workers decreases substantially from 2011 to 2012. Second, our estimates are based on workers who registered at least 1 day as unemployed and job seeking. However, there are also subsidized workers who were, for example, either not unemployed or not job seeking prior to their participation. For these workers, we extrapolate our estimates. Third, we ran aggregated estimations and did not run separate regressions by year of program start, because PS matching becomes too imprecise with small numbers of yearly observations.¹¹

6 | CONCLUSION

Due to aging societies, the demand for formal care will increase whereas the labor force participation, and thus eventually the supply of elderly care nurses, will decrease. In this paper, we therefore evaluate whether subsidized elderly care training puts unemployed workers into long-term elderly care employment.

We analyze rich administrative data for Germany on training in elderly care professions, and, due to the exceptionally long period from 2003 to 2015, we can learn about long-term causality.

Our results show that both retraining and further training in elderly care are beneficial and improve employment in the long term. Further training, which typically lasts only weeks or months, positively impacts participants' employment already in the very short term. By contrast, retraining, which educates elderly care nurses, entails a lock-in period of up to 3 years but leads to substantial long-lasting employment effects afterwards.

Although the results of the direct comparison of further training and retraining should be taken with caution, they suggest that in the long term, retraining participants would have gained the same level of employment had they participated in further training instead. To reduce skill shortages in elderly care, however, retraining appears to be more advantageous. Retraining contributes more strongly to the stock of elderly care workers because a higher share of reemployed workers enters the elderly care sector.

In total, 30,000 workers, that is, approximately 5%, of the employed elderly care stock were trained unemployed workers in 2015. Given that the demand for qualified elderly care nurses continues to be high, public policy should primarily focus on educating unemployed workers through retraining.

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ORCID

Christine Dauth  <https://orcid.org/0000-0001-8090-0057>

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¹⁰We use classification KldB88 for our sample. The numbers on the stock of workers and inflows into subsidized training in Table 2 come from the statistics of the FEA, who applies KldB88 until 2011 and KldB2010 afterwards. The numbers between the two classifications differ because certain care jobs are no longer or newly attributed to elderly care occupations in KldB2010.

¹¹We obtain very similar results using the estimates of the regressions on the yearly strata 2003–2005, 2006–2008, 2009–2012, 2013–2015.

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article.

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