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Nurses leaving the NHS acute and community sectors



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Background and aims



- Targets such as 50k additional nurses rely on increasing retention as well as recruitment
- We document retention of registered nurses in the NHS acute and community sector
 - Distinct from retention in the NHS as a whole, or nursing as a profession, neither of which we study here
- Instead of focusing on one point in time (e.g. retention at the two-year mark), show how retention varies over a nurse's (early) career
- Describe differences between groups of nurses by their and their hospital trusts' characteristics
- Do not make specific policy recommendations to improve retention, but point towards possible ways of targeting support

What does duration analysis do?



- Research question: How does retention vary between nurses and trusts with different characteristics?
- Rather than a sharp distinction between two groups of “leavers” and “stayers”, this focuses on the evolution of leaving rates over time (since hiring)
- Answers a series of question of the form:
 - Of those who were hired, how many left within a year?
 - Of those who were still there after a year, how many left during the second year?
 - And so on...
- Construct a function reflecting the risk of leaving at every point in time: a hazard function

Definitions



- Sector of interest = acute trusts, mental health and learning disability trusts, community trusts, care trusts
- Leaving (the “event” in survival analysis terms) means
 - no earnings (including maternity pay), contracted hours or hours worked recorded in the ESR
 - absent nurses with positive contracted hours haven’t left
 - leaving for at least three months: ignore one- and two-month gaps
 - ~10% of sample nurses have a gap, of on average 11 months
- Leavers may return → A nurse can leave multiple times
 - Formally: a returning nurse becomes “at risk” again if she reappears in the ESR, and may exit the sample again
- For returners, ‘the clock keeps ticking’, i.e. the hazard of leaving is determined by the time elapsed since a nurse was hired, whether or not she left and returned in the interim

Data: The Electronic Staff Record



- Nurses with a permanent or fixed-term assignment
- Inflow sample: Nurses hired since January 2012 in Band 5 or 6
 - The alternative is a stock sample (e.g., everyone who was in the ESR in January 2012)
 - Then inclusion in the data depends on not having left before 2012: a selected sample of long-tenured nurses
 - This introduces a distortion and makes it more difficult to draw robust conclusions from duration models
- Follow these nurses over time (including if they change trusts within the sector, or get promoted beyond Band 6)
- Many nurses are hired from other NHS or non-NHS employers, i.e. not everyone is newly qualified and at the start of their nursing career
- Includes acute and non-acute trusts, but excludes other NHS organisations, e.g. primary care, CCGs, Special Health Authorities
- Monthly data

Limitations



- ESR does not cover all of the NHS
 - nurses may leave this data set for jobs in social care, primary care/GP settings and NHS funded services provided by third sector or private sector providers
 - cannot distinguish retention in the wider NHS vs exits to private-sector health and social care vs exits from nursing
 - cannot distinguish return/onward migration vs other UK employer
- Length of panel: currently eight years
 - not possible to follow a cohort into later career using this approach
- Trust-level staff survey data:
 - we don't know individuals' job satisfaction
 - if groups of nurses within a trust are more/less satisfied with different aspects, we cannot pick up effects of this on retention
 - if the most/least satisfied are less likely to respond to the survey at all, this could distort results

Summary statistics



Average when first observed	
Age in years	32.35
Woman	88.3%
Nationality: UK	72.4%
Old EU (largest group: Spanish)	10.7%
New EU (largest group: Romanian)	2.8%
Other	9.4%
Unknown	4.7%
Band 5	90.2%
Band 6	9.8%
Trust type: Teaching trust	35.7%
Specialist trust	4.1%
Other acute trust	39.0%
Observations	180,429

Average when first observed	
Specialty: Children & Young People	6.5%
Maternity Services	8.4%
Neonatal Nursing	1.3%
Community Mental Health	3.3%
Other Mental Health	8.9%
Community Learning Disability	0.5%
Other Learning Disability	0.6%
Community Services	8.6%
Recruitment source: Newly qualified	8.9%
NHS Organisation	20.2%
Private Health/Social Care	14.2%
Other private sector/self employed	10.9%
Abroad	10.3%
Public/Third Sector	9.2%
No Employment	6.3%
General Practice	0.4%
Return to Practice	0.2%

Estimating a hazard function

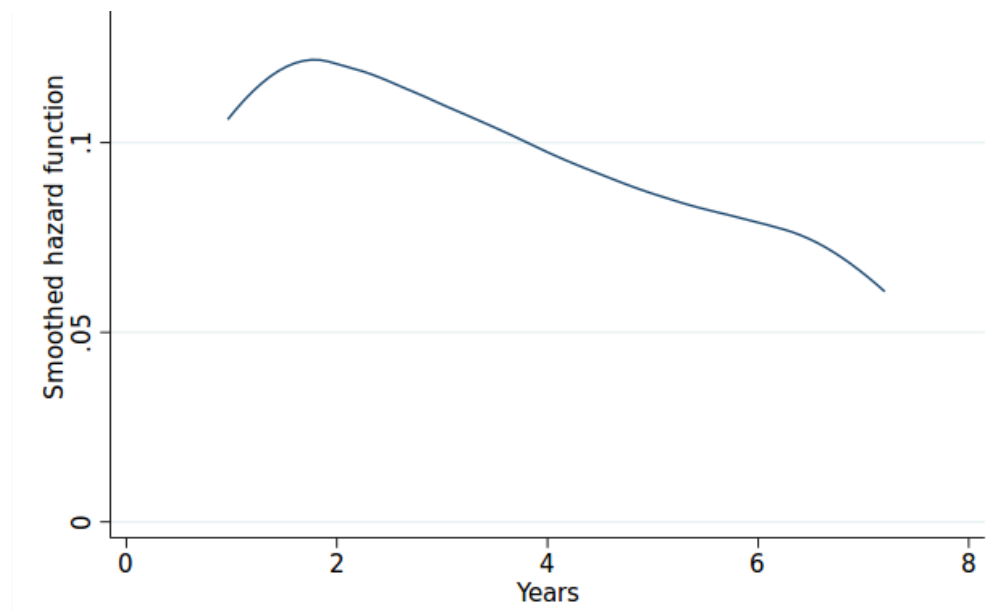
- Reminder: A hazard function describes how likely it is that a nurse that we observe at time t will leave in the next month,
 - t could be “a year after she was hired”, or “three years and four months after she was hired”, or any other number of months
- We can also add characteristics to the model:
 - Nurses’ personal characteristics, e.g. age, ethnicity, nationality
 - Job characteristics, e.g. specialty, pay band
 - Trust characteristics, e.g. whether it’s a Teaching trust
- The simplest way to do this is assuming that these characteristics “shift” the hazard up or down, but don’t change its shape
 - group A of nurses is $X\%$ more likely to leave *at each duration of service*
- Will later look at more flexible models

Interpreting effects

- Estimated effects document differences between groups **on average**
- Like-for-like comparison in a regression framework: e.g. compare men to women adjusting for differences in age, region, specialty, ethnicity, etc
- Does not explain **why** differences arise
- If group A of nurses is more likely to leave, it could be that, on average:
 - they prefer other nursing settings than acute and community care
 - or they have better job opportunities outside nursing
 - or work is more stressful or difficult for them,
 - or they receive less, or less helpful, career support, or
 - or they enter acute & community nursing with less training and experience
 - or many other explanations!
- Past differences needn't be set in stone: Groups who currently leave at higher rates may benefit from targeted support

Shape of the hazard

- “Baseline” hazard function for a nurse who is:
 - a white British woman at median sample age (31 years)
 - in band 5, with the specialty Adult and General
 - in a non-teaching, non-specialist acute trust in the East Midlands
- Characteristics that differ from the baseline will shift this hazard up or down by a fixed amount



How should we interpret a decreasing hazard?

- The pattern that those who stay for (about) two years are subsequently less likely to leave is typical of many labour markets
- Economists consider two competing explanations for this:
 1. **Unobserved heterogeneity**: Nurses who stay for more than two years were different from the start in ways not captured by the data
 - E.g. better suited or more motivated to work in a hospital setting or more inclined to 'settle down' in a long-term job
 2. **True duration dependence**: People who stay more than two years are *not* inherently different to start with
 - Over the first two years, the job becomes less difficult or more enjoyable (increased experience and confidence, more autonomy, more interesting tasks, higher pay, ...)
 - These things *make* nurses less likely to leave
- The two mechanisms are hard to disentangle and the truth is probably a mix of both
- A relevant distinction to think about: 2nd explanation more amenable to intervention!

Proportional hazards results



- **Women** are 17% **less** likely to leave than comparable men
- **(British) Indian** nurses are 30% **less** likely to leave and other **(British) Asian** nurses 23% less likely to leave, than comparable white nurses
- Nurses in **Band six** 5% **less** likely to leave than band five
 - Rises to 30% less for those in seven and above, but nurses in some senior roles (Modern Matrons and Managers) **more** likely to leave
- **Community Mental Health** nurses 32% **more** likely to leave than Adult and General
 - **Neonatal** nurses 25% **less** likely to leave
- Important differences between regions:
 - Relative to the East Midlands, **more** likely to leave (effect size): **Greater London** (21%), South East (11%), South West (9%), East (7%)
 - **Less** likely to leave: **North East** (18%), North West (7%)

- ‘Old EU’ nationals (most of them **Southern European** or **Irish**) 66% (!) **more** likely to leave than comparable British nationals
 - Note: ‘comparable’ includes adjusting for different BAME ethnicities
- ‘New EU’ nationals (mostly **Romanian** or **Polish**) are 15% more likely to leave than comparable British nationals
- Other non-UK nationals (biggest groups **Filipino**, **Indian** and **Zimbabwean**) 8% *less* likely to leave
- Comparing the periods before and after the 2016 Brexit referendum
 - ‘Old EU’ nationals were already more likely to leave before, but this effect intensified after the referendum
 - Cannot detect a change for ‘new EU’ nationals
 - Note: simple comparison of before and after
 - does not attempt to determine whether change is actually *because of* the referendum

Using the staff survey



- ESR and Staff Survey are linked at the level of the trust, not the individual nurse
 - not answering the question “are those satisfied with their pay likely to leave?”, but “are nurses *in trusts where a relatively large share of nurses are satisfied with their pay* less likely to leave?”
- For each question, use the proportion of (registered) nurses in the trust that replied *agree* or *strongly agree* (some questions use slightly different labels or only offer Yes/No options), on average between 2016-20
 - Compare trusts in the bottom, middle, top third for each question
 - Use proportional effects
 - Adjust for individual and trust characteristics: age, gender, ethnicity, pay band, specialty, type of trust, type of role, region, common calendar time effects that affect all nurses

Results using the staff survey



- Nurses in trusts with the highest proportion (39%-57%) reporting they are **satisfied with their pay** are 5% **less** likely to leave
- High share reporting they have felt **unwell as a result of work-related stress** in the past year (45%-61%): 5% **more** likely to leave
- High satisfaction with **flexible work opportunities** (58%-81%): 2% **less** likely to leave, less clear that effect is different from zero ($p=0.052$)
- No significant difference for trusts with a high share of nurses reporting they **look forward to going to work** or that **their organisation takes positive action on health and wellbeing**
- High share reporting **unrealistic time pressures at work**: 2% *less (!)* likely to leave
 - There is a correlation between greater satisfaction with pay and time pressure, possibly also correlated with e.g. motivation or ambition?

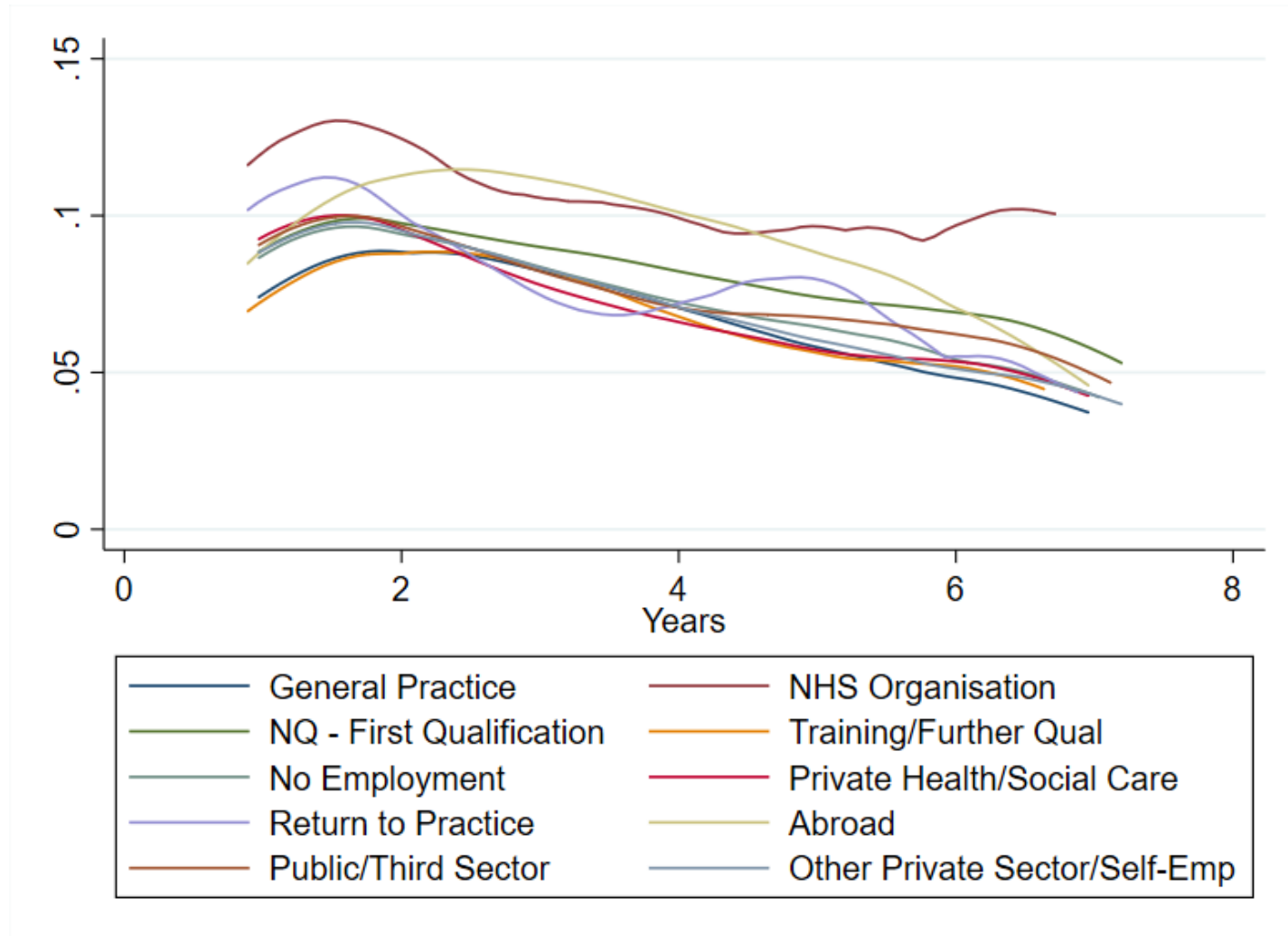
Stratified model



- More flexible way of describing differences between groups than proportional hazards
- Allows for a characteristic to affect the shape, not just the level of the hazard
 - e.g. group A leave more quickly, but only in the first two years of service
- This flexibility can be introduced for one characteristic at a time: effects of other covariates are still assumed proportional
- Observe how other effects change to answer questions such as:
 - Is the effect of age due to older and younger nurses working in different regions, where the shape of the hazard is different?
 - Is the effect of nationality due to non-UK nationals being concentrated in trusts where the shape of the hazard is different?

Stratified model: Recruitment source

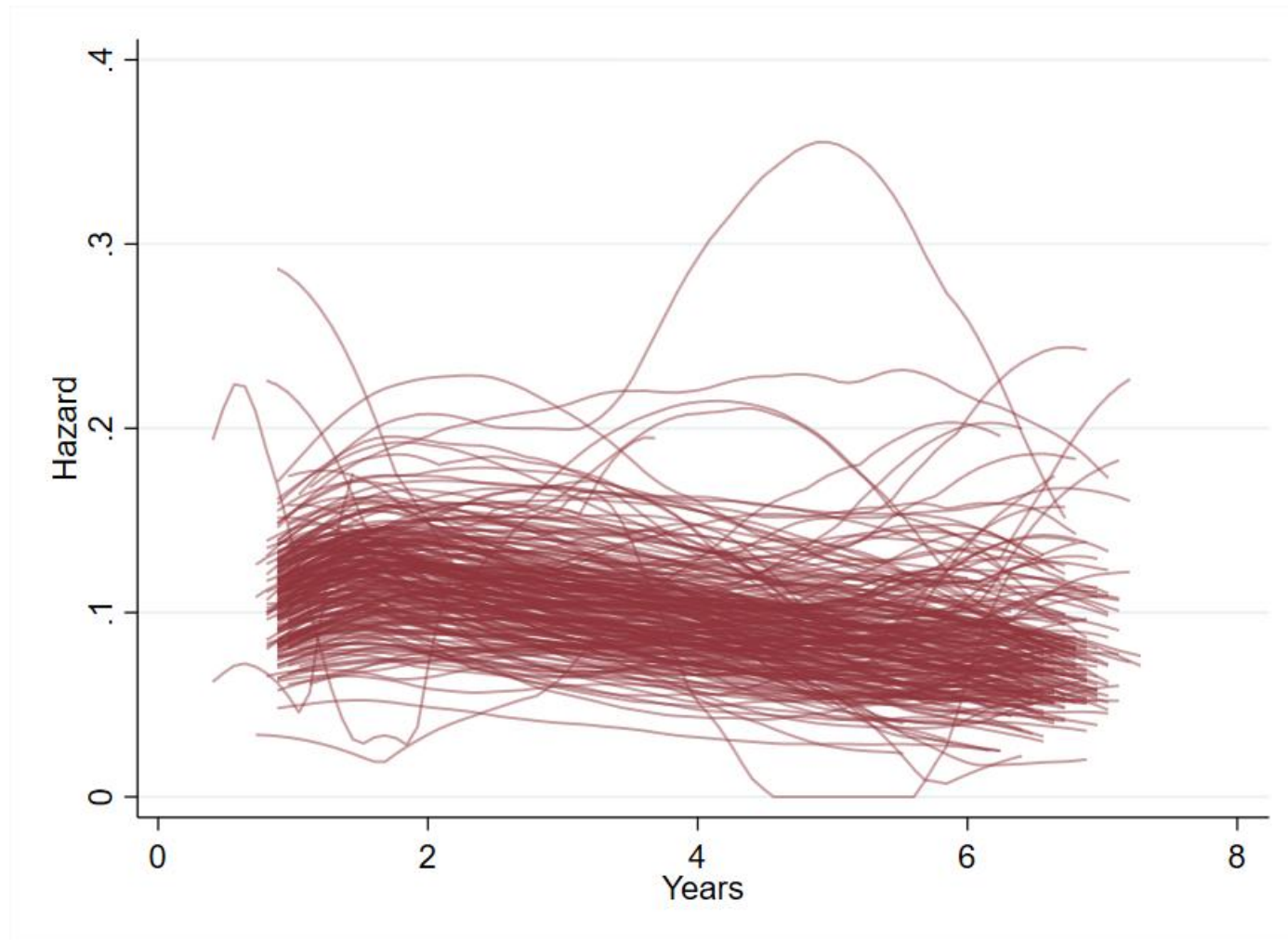
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Stratified model: Recruitment source

- Nurses who stay for two years are subsequently less likely leave across a wide range of recruitment sources
- Second peak at 5-6 years for those recruited from other NHS organisations and return to practice (note this group is small, 396 nurses)
- Higher leaving hazard for those recruited from abroad, especially at around 3 years
- Differences between those recruited from public versus private sector are small
- After more than two years, the hazard is higher for those who joined as newly qualified nurses than those who joined from further training or elsewhere in the NHS (who are selected as they are 'survivors' of a previous process)

Stratified model: Trusts



Stratified model: Trusts

- Allows the shape and level of the hazard to differ between trusts
- Other effects are now comparing nurses with different characteristics working *in the same trust*
- Most coefficients remain similar to the non-stratified model
 - This suggests that concentration of nurses with particular characteristics in particular trusts is not very important
 - E.g. Community mental health nurses are more likely to leave than other specialties, even if we compare them to their colleagues in the same trust
 - **Nationality** effects for 'Old EU' nationals remain large

Stratified model: Trusts



- Some effects become smaller or disappear:
 - Band 6 only 3% less likely to leave (than Band 5)
 - **Whole trusts** with more nurses in Band 6 have better retention that we would otherwise expect, not just the individual nurses
 - Managers are not significantly more likely to leave than colleagues in the same trust
- Some effects get stronger:
 - Education Staff (i.e. those who train Nurse Learners) 63% more likely to leave

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