Impact case study (REF3)

Institution: University of Southampton	
Unit of Assessment: 03 Allied Health Professions, Dentistry, Nursing and Pharmacy	
Title of case study: 03-01 Influencing changes to nurse staffing legislation, policy and practice to improve patient safety in hospitals in the UK and internationally	
Period when the underpinning research was undertaken: 2011 – 2020	
Details of staff conducting the underpinning research from the submitting unit:	

Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Jane Ball	Professorial Research Fellow	October 2014 – present
Chiara Dall'Ora	Lecturer	September 2017 – present
Peter Griffiths	Professor; Chair of Health Services Research	January 2011 – present
Jeremy Jones	Principle Research Fellow	October 2004 – present

Period when the claimed impact occurred: August 2013 – December 2020	
Is this case study continued from a case study submitted in 2014? N	

1. Summary of the impact

Research at the University of Southampton has influenced legislation, policies and campaigns to create safer staffing on hospital wards around the world, by exposing the patient safety risks of low nurse staffing levels. Errors and omissions in care are common and lead to thousands of avoidable deaths; our research showed that low nurse staffing and skill mix are factors in many of these deaths. The findings motivated change by providing core evidence for: global policy (World Health Organisation, International Council of Nursing); legislation (Wales, Scotland); changes in practice (Staffing Framework in Ireland); safe-staffing campaigns (e.g. Royal College of Nursing, Safe Staffing Alliance); and the development of safe-staffing guidelines in the UK (NHS Improvement, and National Institute for Heath and Care Excellence – NICE). Increases in nurse staffing in line with the 2014 NICE guidelines, are estimated to lead to 1,760 fewer deaths per year in English hospitals.

2. Underpinning research

The Francis Inquiry (2013) into the care scandal at Mid Staffordshire NHS Trust found that some patients had gone without essential nursing care, with fatal consequences. Nurse staffing levels were identified as a contributory factor and the inquiry recommended that evidence-based national policy and guidance on safe-staffing be developed. Subsequently, our research made a significant contribution to an evidence base that demonstrates direct associations between inadequate nurse staffing levels and increased risk of death. Findings from a large-scale observational study across European hospitals, undertaken as part of the global RN4Cast consortium, have demonstrated associations between Registered Nurse (RN) staffing levels and deaths among hospitalised patients [**3.1**], shown that omissions in nursing care associated with low staffing are common [**3.2**] and shown that these omissions – termed 'care left undone' – contribute to increased risk of death [**3.6**]. Our research established the risks associated with substitution between registered nurses and lesser trained support staff [**3.2**-**3.5**].

Developed with stakeholders in senior health service delivery and policy roles, RN4Cast (Griffiths and Ball co-investigators) was the largest global study to examine the relationship between nurse staffing and patient outcomes. Funded through the EU FP7 programme up to December 2011 (€3m), the cross-sectional study included 488 hospitals in 12 European countries with surveys of 33,659 nurses and analysis of discharge abstracts from over 400,000 surgical patients. The study continued with the major data analysis and outputs occurring between 2012 and 2020. Professor Peter Griffiths was the UK PI and led the workstream on patient outcomes, and Professor Jane Ball led the survey in England. The research quantified the potential consequences of unsafe staffing in European hospitals: each additional patient per nurse was associated with an average 7% increase in the odds of death [**3.1**]. They found that hospitals with a higher proportion of registered nurses had lower patient mortality rates [**3.5**].

Pivotal findings based on analysis led by Southampton researchers include:

- Within the UK there was substantial variation in registered nurse staffing levels between hospitals for wards of the same specialty ranging from a day-time average of five patients per RN through to more than 10 patients per nurse [**3.2**].

- A RN:patient ratio in excess of 1:8 was associated with increased risk of care compromise; a 1:6 ratio was associated with significantly lower risk of missed care on acute wards [**3.2**].

- Nurses frequently reported that important care was 'left undone' on NHS wards due to high workload pressure; 86% of RNs reported missing one or more items of care on their last shift. When RN staff levels were high, the rate of such reports significantly decreased [**3.2**].

- Higher reported missed care partially mediated the relationship between low staffing and increased mortality [**3.6**].

- Associations between registered nurse staffing levels and patient outcomes existed independently from the association with medical staffing levels [**3.4**].

- Hospitals with higher levels of lesser trained support staff had higher mortality [**3.3**, **3.4**]; there was no evidence that support staff were complements or substitutes for RNs in reducing the rate of care omissions [**3.2**].

While RN4CAST provided evidence that lower RN staffing and level of qualification was associated with increased mortality in European hospitals [**3.1**], subsequent Southampton research addressed important residual gaps in the evidence, supporting a causal interpretation, and a policy response. Following the RN4Cast study, Southampton continued to lead research on safe nurse staffing, through six studies with £2.8m funding (mainly NIHR). Studies included a major research synthesis [**3.3**], commissioned by NICE in order to provide national clinical guidelines on safe staffing. This identified strengths and limitations in the evidence base (e.g. identifying a lack of longitudinal studies), informed NIHR research commissioning and guided our ongoing research programme. Our studies have considered both doctor and nursing assistant staffing levels [**3.3, 3.4, 3.5**], as well as nursing, filling a key gap. Rarely have studies considered staff groups other than registered nurses, and thus could neither rule out confounding with general hospital staffing resources nor could they address the potential for substitution between staff groups – a crucial policy issue in the face of staff shortages. Our research has provided the first empirical evidence for a hypothesised causal pathway through omissions in care [**3.6**]. We have also elucidated specific staffing levels associated with harm as opposed to general linear relationships reported previously [**3.2**].

3. References to the research

3.1 Aiken, L. H., Sloane, D. M., Bruyneel, L., Van Den Heede, K., **Griffiths, P**., Busse, R., Diomidous, M., Kinnunen, J., Kózka, M. & Lesaffre, E. 2014. Nurse staffing and education and hospital mortality in nine European countries: a retrospective observational study. *The Lancet,* 383**,** 1824-1830. *[Citations 1,801 Altmetrics 1,983]* https://doi.org/10.1016/S0140-6736(13)62631-8

3.2 Ball, J. E., Murrells, T., Rafferty, A. M., Morrow, E. & **Griffiths, P**. 2014. 'Care left undone' during nursing shifts: associations with workload and perceived quality of care. *BMJ Qual Saf,* 23**,** 116-25. *[Citations: 552; Altmetrics 419]* https://doi.org/10.1136/bmjqs-2012-001767

3.3 Griffiths P., Ball J., Drennan J., Dall'ora C., Jones J., Maruotti A., Pope C., Saucedo A.R., Simon M. 2016 Nurse staffing and patient outcomes: strengths and limitations of the evidence to inform policy and practice. A review and discussion paper based on evidence reviewed for the National Institute for Health and Care Excellence Safe Staffing guideline development. *International Journal of Nursing Studies*. 1;63:213-25. *[Citations 149; Altmetrics 74]* https://doi.org/10.1016/j.ijnurstu.2016.03.012

3.4 Griffiths, P., Ball, J., Murrells, T., Jones, S. & Rafferty, A. M. 2016. Registered nurse, healthcare support worker, medical staffing levels and mortality in English hospital trusts: a cross-sectional study. *BMJ Open,* 6**,** e008751. *[Citations: 103; Altmetrics 621]* https://doi.org/10.1136/bmjopen-2015-008751

3.5 Aiken, L. H., Sloane, D., **Griffiths, P**., Rafferty, A. M., Bruyneel, L., McHugh, M., Maier, C. B., Moreno-Casbas, T., **Ball, J. E**. & Ausserhofer, D. 2016. Nursing skill mix in European hospitals:

cross-sectional study of the association with mortality, patient ratings, and quality of care. *BMJ Quality & Safety*, bmjqs-2016-005567. *[Citations:344; Altmetrics 1,491]*
https://doi.org/10.1136/bmjqs-2016-005567

3.6 Ball, J.E., Bruyneel, L., Aiken, L.H., Sermeus, W., Sloane, D.M., Rafferty, A.M., Lindqvist, R., Tishelman, C., **Griffiths, P**. and RN4Cast Consortium, 2017. Post-operative mortality, missed care and nurse staffing in nine countries: A cross-sectional study. *International Journal of Nursing Studies.* *[Citations: 206; Altmetrics 707]* https://doi.org/10.1016/j.ijnurstu.2017.08.004

[Data from Google Scholar, Altmetric.com 07 December 2020]

4. Details of the impact

The outcomes from the Francis Inquiry brought serious concerns around nursing in the NHS to the attention of policymakers, the health profession and the wider public. Findings from Southampton research informed and shaped: the ensuing public debate around safe staffing for the duration of the impact period; sustained campaigns for legislative change run by advocacy groups; subsequent developments in 'safe-staffing' clinical guidelines and legislation in the UK and beyond. The International Council of Nurses' CEO commented: "*The Southampton team has made an essential contribution to establishing that safe nurse staffing saves lives. As that recognition has influenced policies to protect and enhance nurse staffing in many countries around the globe, their research has contributed to reducing unnecessary suffering and deaths in hospitals* [**5.1**]."

Influencing public policy debates over safe staffing levels for nurses

Coming just months after the Francis Inquiry, our findings on missed care and nurse staffing levels [**3.2**] – in particular that 86% of nurses left necessary care undone, and that this was related to RN staffing levels – caused a public outcry. Having been on the front page of *The Times* and on BBC Radio 4's *Today Programme* and cited in a public meeting by Sir Robert Francis QC two days before the beginning of the REF impact period, the findings continued to stimulate intense debate for weeks and months afterwards through national newspapers, radio and television [**5.2**]. Altmetric data shows that paper **3.2** was still being cited in news articles in 2015, 2017 and 2019 and has reached 'an upper bound of' 2.46 million people via sustained Twitter mentions [**5.2**]. The findings linking nurse staffing levels and mortality, published in *The Lancet* in February 2014 [**3.1**], received worldwide media attention, reflected in an Altmetric online attention score which puts it in the top 0.01% of all rated outputs. It was covered in 33 news outlets, with several direct references still being made by international media between 2018 and 2020; it has reached an upper bound of 7.2 million people via Twitter [**5.2**]. The subsequent studies also received significant coverage and prompted continuing debate. For example, paper **3.5** was covered by 56 international news outlets between 2016 and 2020, reaching an upper bound of 4.16 million people via Twitter [**5.2**].

This widespread and sustained public debate contributed to a change in discourse among policymakers and health practitioners; it provided evidence that shaped the demand for 'safe staffing', triggering a shift towards considering nurse staffing as a critical system-level factor. The Safe Staffing Alliance, supported by organisations like Royal College of Nursing (RCN) and UNISON, has campaigned throughout the impact period for a legal minimum RN:patient ratio of 1:8, based on our findings. In January 2014 Andrew George MP secured a House of Commons debate with health minister Dr Daniel Poulter MP on the staffing of acute hospital wards, with a particular focus on RN staffing levels. In it he backed the Safe Staffing Alliance's campaign and cited our research [**3.2**], saying: '*The RN4Cast survey of 32 English hospitals, including more than 400 wards, showed that 43% had registered a nurse staffing ratio of more than 1:8* [**5.3**].' Evidence from the Southampton studies has underpinned a long-running policy campaign by the RCN for legislation for safe staffing in all parts of the UK; the research was cited on multiple occasions in four major policy reports published by RCN between 2017 and 2019 [**5.4**].

RCN's CEO wrote that the research '*had a direct effect on generating policy and influencing national decision makers across the UK … shining a light on previously unknown linkages between insufficient nurse staffing levels and the impact this has upon patient care … This will undoubtedly be an important contribution towards securing legislation (in England specifically – legislation was passed in Scotland and Wales as detailed below) and ultimately safe and effective care for patients in all parts of the UK* [**5.5**].' A founding member of the Safe Staffing Alliance and clinical advisor to the NIHR Dissemination Centre wrote: '*Professor Griffiths and Professor Ball's research has been*

highly visible and influenced the way in which nurse staffing has been considered both by policy makers and service providers, providing an evidence base to counter the view that the problems were purely due to a compassion deficit amongst individual nurses [**5.6**]*.*'

Shaping new polices, clinical guidelines and legislation on safe staffing in the UK

Southampton researchers were commissioned by NICE to undertake the evidence reviews for guidance on safe staffing in adult inpatient wards and accident & emergency departments [**3.3**]. Little research had been conducted in the UK so Southampton research on missed care [**3.2**] was important to enable NICE to identify a specific 'warning level' for nurse staffing on NHS acute wards. Reflecting a key finding from our research, the final NICE guideline *Safe staffing for nursing in adult inpatient wards in acute hospitals*, published in July 2014 [**5.7**], recommended (para 1.5.3): '*Take into account that there is evidence of increased risk of harm associated with a registered nurse caring for more than 8 patients during the day shifts*.' It said that if RNs on a particular ward were caring for more than eight patients, the senior management and nursing managers should monitor nursing red flag events, perform early analysis of safe nursing indicator results and, if necessary, take action to ensure staffing is adequate to meet patients' needs. It concluded: '*In many cases, patients' nursing needs, as determined by implementing the recommendations in this guideline, will require registered nurses to care for fewer than 8 patients*.' The commissioned evidence review co-authored by Griffiths, Ball and Jones was published with the guideline.

Griffiths and Jones co-authored an evidence review [**5.8**] for the planned NICE guideline: *Safe Staffing for Nursing in Accident and Emergency Departments* and Griffiths was invited to join the NICE guideline development group for the safe staffing programme. After responsibility for this work passed to NHS Improvement in 2015 Griffiths and Ball joined the working groups convened to develop further guidance for acute and community care settings. NIHR's clinical advisor [**5.6**] wrote: '*Whilst [NICE] were unable to make recommendations following their review, the clarity of the Southampton evidence led the National Quality Board to publish expectations for nursing and midwifery staffing to help NHS provider boards make local decisions that will deliver high-quality care…In my role as a non-Executive Director at Basildon and Thurrock University Hospitals NHS FT, I was able to see first-hand how Professor Ball and Professor Griffiths' work was used by the Director of Nursing to support Board discussions on setting staffing establishments*.'

Southampton research [**3.3**, **3.4**], including the 1:8 'warning level', was cited on multiple occasions in three key 'improvement guides' published by NHS Improvement between 2016 and 2019 to ensure safe staffing levels [**5.9**]; Griffiths acted as scientific advisor to NHS Improvement's 'Safe & Sustainable Staffing' panel. Describing Southampton evidence as '*significant in shaping these resources*', the Deputy Chief Nursing Officer wrote [**5.10**]: '*Professor Griffiths and Ball's work has been highly influential internationally and nationally here in the NHS. Working with NHS Improvement, Professors Ball and Griffiths have been working to help define and shape policy in relation to the workforce of the NHS. Their work has significantly shaped the knowledge base of nursing work and safe staffing*.'

While the UK Government, within the wider political context of austerity and NHS budget constraints, has resisted calls for legislation on safe staffing, the Welsh and Scottish Governments have implemented legislation to set statutory staffing levels, informed by Southampton's evidence and in response to public concerns and debate to which Southampton research has contributed. The Safe Nurse Staffing Levels (Wales) Bill was proposed by Kirsty Williams MS (Member of Senedd) in December 2014 and she cited **3.1** as key evidence to support the Bill [**5.11**]. In Feb 2015, Griffiths was invited to present evidence to the Welsh Senedd during the Bill process (he cited findings from **3.1** and **3.2** to do so) and Age Cymru and BMA Wales also cited **3.1** [**5.11**]. The bill passed in 2016. The research [**3.1**] was cited in the Scottish Government's Nursing 2030 vision, published in 2017. In October 2017, in the Scottish Parliament [**5.12**], Miles Briggs MSP asked First Minister Nicola Sturgeon for her government's response to the concerns raised around nurse staffing levels by the RCN in its report *Safe and Effective Staffing: Nursing Against the Odds*. This report [**5.4**] was based in large part on Southampton evidence, citing **3.1**, **3.2**, **3.4** and **3.6**. In response, the First Minister said: '*The RCN has called for safe-staffing legislation, and we intend, as we set out in the programme for government, to take that forward.*' [**5.12**] Legislation to support staffing across health and social care services was passed by the Scottish Parliament in May 2019.

NIHR commissioned Ball and Griffiths to carry out a two-year evaluation of the implementation of national safe staffing guidance in England following the Francis Inquiry. The outcomes, published in 2019, provide an indication of the impact of the policy and guideline changes in England [**5.13**]. They found that RN staffing numbers had increased nationally by 6.4% between 2013 and 2017; 74% of Directors of Nursing said overall staffing levels had improved and two-thirds reported NICE guidelines had been helpful in achieving safe staffing in their hospitals. Based on data from one NHS hospital, they estimated that since 2013 there was a 16% reduction in days staffed with more than 8 patients per RN. If such a decrease in low staffing was extrapolated across all English acute hospitals this would be associated with approximately 1,760 fewer deaths per year [**5.13**].

Shaping new polices and clinical guidelines on safe staffing beyond the UK

Southampton's finding that important omissions in care were associated with low staffing has led to its use by the Irish Government as an indicator of staffing insufficiency; 'Care Left Undone Events' (CLUES) have been adopted in Ireland as part of a new approach to safe staffing [**5.14**]. Writing that the impact of the research on the '*development, testing and implementation [of a new framework] cannot be underestimated*', the Deputy Chief Nursing Officer for Ireland stated: "*[Southampton's] published evidence on care left undone/missed care has provided an important outcome indicator, capable of measurement at ward level, and incorporation into Government Policy for system-wide implementation* [**5.14**].' Ball and Griffiths were contacted directly and asked for advice on how the measure used in their research could be adapted for this purpose.

Globally, the research continues to raise awareness of the need for 'safer staffing' and prompt action to change policy and practice. It is routinely cited in authoritative reports [**5.15**] including the WHO's *European Strategic directions: strengthening nursing and midwifery towards Health 2020 goals* [cites **3.1**] and *State of the World's Nursing 2020* [cites **3.1**, **3.3**, **3.5**], and the International Council of Nurses' formal response to the WHO's *Global Strategy on Human Resources for Health: Workforce 2030*. Paper **3.1** was cited by Australia's Department of Health in its 2019 report *Educating the nurse of the future*, while **3.1** and **3.5** were referenced by the Australian Nursing and Midwifery Federation (Tasmanian Branch) and the Queensland Nurses & Midwives' Union to support their calls for higher ratios of nurses to patients. The evidence was cited by the American Nurses Association (2015) report *Optimal Nurse Staffing to Improve Quality of Care and Patient Outcomes* and the Belgian Health Care Knowledge Centre (broadly equivalent to NICE), whose 2020 report *Safe Nurse Staffing Levels In Acute Hospitals* cites **3.1**, **3.2**, **3.3** and **3.5**. [**5.15**]

5. Sources to corroborate the impact

5.1 Corroborating statement from the CEO of the International Council of Nurses (ICN).

5.2 Media and Altmetrics data.

5.3 Hansard report, House of Commons debate on the staffing of acute hospital wards, 15/1/2014.

5.4 RCN policy reports 2017-2019.

5.5 Corroborating statement from the CEO of the Royal College of Nurses (RCN).

5.6 Corroborating statement from Clinical Advisor, NIHR Dissemination Centre.

5.7 NICE Guideline SG1 (2014) *Safe staffing for nursing in adult inpatient wards in acute hospitals.*

5.8 University of Southampton NICE evidence review.

5.9 NHS Improvement guides.

5.10 Corroborating statement from Deputy Chief Nursing Officer for England.

5.11 Impact on Welsh legislation: Senedd Cymru.

5.12 Minutes of Scottish Parliament proceedings.

5.13 NIHR-commissioned evaluation of impact of policy changes in England on safe staffing levels.

5.14 Corroborating statement from Former Deputy Chief Nurse for Ireland [page 3, paragraph 1]

5.15 Report: Shaping policy beyond the UK (including WHO, ICN, Australia, USA and Belgium).