

Impact case study (REF3)

Institution: University of Leeds		
Unit of Assessment: 3		
Title of case study: Improving the safe use of medicines for older people living in care homes across the UK		
Period when the underpinning research was undertaken: 2006-present		
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:
David Alldred	Professor of Medicines Use and Safety	2002-2013; 2015-present
David Raynor	Emeritus Professor of Pharmacy Practice	1996-2016; Emeritus 2016-present
Amrit Daffu O'Reilly	Research Fellow	2016-present
Mary-Claire Kennedy	Lecturer in Pharmacy Practice	2015-present
Period when the claimed impact occurred: 2013-present		
Is this case study continued from a case study submitted in 2014? N		
1. Summary of the impact (indicative maximum 100 words)		
<p>Leeds researchers first proposed and tested the concept of pharmacist-led clinical medication review and showed its effectiveness in care homes – leading to a collaborative study on medicines safety in care homes, showing seven out of ten residents had at least one medication error on any given day, with an estimated 98,000,000 errors/annum. As a direct result, there was a ministerial-led summit, and the Department of Health (DH) issued a 'Health Alert' requiring NHS trusts to act immediately, citing our findings. The research subsequently led to, and significantly influenced the design and implementation of the GBP20,000,000 NHS England Medicines Optimisation in Care Homes Programme, as well as recommendations in the 2019 NHS Long-Term Plan.</p>		
2. Underpinning research (indicative maximum 500 words)		
<p>Leeds researchers (including Alldred and Raynor) first proposed and tested the concept of 'clinical medication review' by pharmacists of people living in their own homes. This research showed that the approach could reduce the number and cost of medicines without adverse effects such as increased use of services. We subsequently successfully tested this model in the care home setting where frail older patients are commonly prescribed multiple medicines with an increased risk of adverse drug events. The study of 661 patients in 65 care homes in Leeds confirmed that the prescribing of medicines in this setting was sub-optimal, leading to a loss of potential benefit and an increased risk of harm [1].</p> <p>In 2005, a Department of Health (DH) call for research into improving safe use of medicines in care homes led to a collaboration with the University of London School of Pharmacy and University of Surrey to undertake the <i>Care Homes' Use of Medicines Study</i> (CHUMS). This combined Leeds research expertise in medicines use in care homes (Raynor and Alldred) with medicine error research from London and ergonomics expertise from Surrey.</p> <p>Alldred was the Project Co-ordinator for the three sites in the study, which comprised 55 care homes in Yorkshire, Cambridgeshire and London. Researchers undertook clinical medication</p>		

reviews, scrutinised GP and care home records, visited pharmacies, observed medication administration and conducted 89 interviews with GPs, pharmacists and care home staff. The analysis showed seven out of ten patients experienced at least one medication error on any given day with errors occurring throughout the system, from prescribing to dispensing to medicines administration. The research showed that factors contributing to errors included: doctors who were not accessible, did not know the residents and lacked information in homes when prescribing; staff workload, lack of medicines training and drug round interruptions; lack of team work among care and health professionals; inaccurate medicine records and reliance on verbal communication [2,3].

We made several recommendations to reduce the risk of medicines errors, including that each home have a lead GP to co-ordinate prescribing and monitoring of medicines; that clinical pharmacists regularly review residents to identify and rectify errors; and that pharmacies and homes should review how they order and dispense medicines. We also recommended that within Primary Care Trusts in England, the Chief Pharmacist should take responsibility for ensuring safe systems. These recommendations subsequently led to policy and practice changes nationally.

Following this, a Cochrane systematic review led by **Aldred** with **Kennedy** 'Interventions to optimise prescribing for older people in care homes' [4] was undertaken in 2013 and updated in 2016. Along with the underpinning research described above, this review contributed to the successful GBP2,000,000 NIHR Programme Grant for Applied Research application for the Care Homes Independent Pharmacist Prescribing Study (CHIPPS) with **Aldred** as co-applicant, work package lead and Principal Investigator for Yorkshire and Humber and **Daffu-O'Reilly** as Research Fellow. CHIPPS is testing the effectiveness and cost-effectiveness of pharmacist prescribing in care homes [5,6]. Such prescribing allows efficient implementation of the recommendations from CHUMS, including someone taking overall responsibility for medicines in care homes, e.g. a pharmacist.

3. References to the research (indicative maximum of six references)

1. **Zermansky AG, Aldred DP, Petty D, Raynor DK** et al. (2006). Clinical medication review by a pharmacist of elderly people living in care homes -randomised controlled trial. *Age and Ageing*, **35**:586-91. doi: [10.1093/ageing/af1075](https://doi.org/10.1093/ageing/af1075)

First published paper demonstrating the now common use of 'clinical medication review' for care home residents

2. **Aldred DP, Barber ND, Raynor DK, Dickinson R** et al. (2009). Care home use of medicines study (CHUMS): Medication errors in nursing and residential care homes – prevalence, consequences, causes, and solutions. Report to the Patient Safety Research Portfolio. Department of Health, London. <https://tinyurl.com/1xlq7qnr>

Peer reviewed report to the Department of Health Patient Safety Research Programme; from which the DH drew the evidence to develop recommendations

3. Barber ND, **Aldred DP, Raynor DK, Dickinson R** et al. (2009). Care homes' use of medicines study: prevalence, causes and potential harm of medication errors in care homes for older people. *Quality and Safety in Health Care*, **18**:341-346. doi: [10.1136/qshc.2009.034231](https://doi.org/10.1136/qshc.2009.034231)

Publication of the main findings of the CHUMS study

4. **Aldred DP, Kennedy MC**, Hughes C, Chen TF, Miller P (2016). Interventions to optimise prescribing for older people in care homes. *Cochrane Database of Systematic Reviews*, 2:CD009095. doi: [10.1002/14651858.CD009095.pub3](https://doi.org/10.1002/14651858.CD009095.pub3).

Comprehensive review of the international evidence using Gold standard methodology

5. Millar A, **Daffu-O'Reilly A**, Hughes C, **Aldred DP**, et al, on behalf of the CHIPPS team (2016). Development of a Core Outcome Set for effectiveness trials aimed at optimising prescribing in older adults in care homes. *Trials*, 18:175. doi: [10.1186/s13063-017-1915-6](https://doi.org/10.1186/s13063-017-1915-6)

Development of a Core Outcome Set to be used to harmonise outcome measures internationally for studies of prescribing in care homes – developed as part of the CHIPPS programme

6. Inch J, Notman F, Bond C, **Aldred DP**, Arthur A, Blyth A, **Daffu-O'Reilly A**, Ford J, Hughes CM, Maskrey V, Millar A, Myint PK, Poland FM, Shepstone L, **Zermansky A**, Holland R, Wright D; CHIPPS Team et al. (2019). The Care Home Independent Prescribing Pharmacist Study (CHIPPS)—a non-randomised feasibility study of independent pharmacist prescribing in care homes. *Pilot and Feasibility Studies*, 5:89. doi: [10.1186/s40814-019-0465-y](https://doi.org/10.1186/s40814-019-0465-y)

Feasibility of the novel complex intervention developed and implemented

Note: All Leeds researchers in **bold**. Publications available on request from the HEI.

4. Details of the impact (indicative maximum 750 words)

There are 370,000 older people living in 10,000 care homes in England, many being frail, vulnerable and taking many medicines. Work at Leeds (2006) introduced the concept of clinical medication review in care homes and led to collaboration with teams in London and Surrey to carry out the DH-commissioned CHUMS study. We showed that for 70% of care home residents (taking on average eight medicines per day), there was one or more medication error on any given day, resulting in an estimated 98,000,000 errors/annum in the sector. Errors were found in prescribing, monitoring, dispensing or administration, and there was a lack of teamwork from the health and care professionals involved. The publication of the report led to a ministerial summit with Aldred and others, to discuss the findings and develop a way forward.

In 2010, the Chief Pharmaceutical Officer and the Director General of Social Care jointly wrote to all Directors of Adult Social Services and PCT Chief Pharmacists drawing attention to CHUMS as “an important research study” which “strongly indicates there is considerable scope for improvement” in how medicines are used in care homes. At the same time an ‘immediate action’ DH Alert was issued citing the findings of CHUMS, requiring PCTs to work with care home staff, GPs and pharmacists to determine how medication errors in care homes can be reduced. This led to changes in practice and the commissioning of new services across the country.

The Centre for Pharmacy Postgraduate Education (CPPE) developed learning programmes prompted and informed by CHUMS and this has been delivered to over 2000 pharmacy staff across England as of 2019 [A,B].

Commenting on the significant impact the CHUMS study has had on the development of these learning programmes, the CPPE Director, Head of National Pathways, and Senior Pharmacist for the CPPE Medicines Optimisation in Care Homes training pathway said:

“The findings of your CHUMS research heavily influenced how the content of the learning programmes was created. We looked at the findings and issues in your research and addressed these systematically throughout the pathways...Your research has undoubtedly had a positive

impact on how medicines optimisation roles in care homes are being carried out and has been vital in improving the safety and care in care homes throughout the country” [B].

In March 2014, NICE published ‘Managing medicines in care homes’ [C]. Alldred was a member of the Guideline Development Group and the guidance cited five papers from our research. In addition, NICE published a Quality Standard (QS85) along with other resources. This standard cites CHUMS <https://www.nice.org.uk/guidance/qs85/chapter/Introduction>. The Care Quality Commission use this guidance when inspecting care homes nationally and assessing quality of care provision.

In 2016 our underpinning research which identified integrating clinical pharmacy as part of the solution to reducing medication errors in care homes (and improving medicines use more widely) directly led to the conception of the GBP20,000,000 NHS England Medicines Optimisation in Care Homes (MOCH) Programme [D,E]. Alldred sat on the NHS England Steering Group and shaped the development of MOCH by presenting evidence of the effectiveness of pharmacists working in care homes based on CHUMS, the Cochrane review and CHIPPS. Alldred significantly contributed to the model of clinical pharmacy provision for the programme and the logic model for MOCH was based on the CHIPPS logic model [E]. Launched in 2018 across every Sustainability and Transformation Partnership/Integrated Care System, MOCH has integrated 356 new pharmacists and pharmacy technicians into existing primary care and social care teams across England. Alongside the programme, a bespoke national training pathway for 600 care home pharmacy professionals was introduced. The CHIPPS Core Outcome Set contributed to the development of the programme’s evaluation plan and Alldred has had ongoing input as an expert adviser into the evaluation plan.

According to the NHS Care Homes Pharmacy Lead for NHS England:

“[CHUMS] was a call to action for the system to urgently develop solutions to solve widespread issues facing care home residents such as prescribing errors and lack of structured review. The CHUMS study helped shape many initiatives across the country... Your research identified major areas of concern in the prescribing pathway and through pilots across England and then the NHS England Vanguard, we now know that integrating clinical pharmacy into care homes improves quality of care and reduces risk of medication harm/ errors in care homes...The MOCH programme led to England wide support for care homes residents with medicines optimisation through structured medication reviews, which now feature as a core part of the new Primary Care Network Enhanced Health in Care Homes Framework and service. Your work directly aligns to the fact that over the last few years medicine organisation reviews improve the quality and care and safety of care in residents across the UK” [E].

The influential 2019 NHS Long-Term Plan [F] stated that all care homes will be “supported by a consistent team...including named general practice support” and “care home residents will get regular clinical pharmacist-led medicine reviews where needed”. There is a direct thread between these plans, and the findings of the CHUMS study, including our recommendations for a lead GP to co-ordinate prescribing and monitoring of medicines, and for clinical pharmacists to regularly review residents [and their medicines]. These recommendations will now be enacted nationwide through Primary Care Networks as specified in the GP contract 2020-2024 [G].

The influential report on the *Prevalence and Economic Burden of Medication Errors in the NHS in England* used CHUMS as the index study to estimate that there are 98 million medication errors in care homes per annum, with 91 million administration errors [H] - this represents 40% of errors in primary care. NHS England's Medicines Safety Improvement Programme (MSIP; 2019-2022) is part of the NHS Patient Safety Strategy [I] and is a specific response to the WHO

Medication without Harm Global Challenge [J]. Due to the error rates found in CHUMS, the MSIP has prioritised reducing medication administration errors in care homes and Aildred has provided expert advice to the project lead for the 15 English Patient Safety Collaboratives (PSC) to design a national project, informed by CHUMS and CHIPPS, to achieve a reduction in such errors in 2020-21. This advice contributed to the investigatory work the PSC undertook in 1102 care homes and the planning on how to test interventions to make medicines use safer.

The instrumental role of CHUMS and CHIPPS in informing the work of the MSIP has been confirmed by the Clinical Improvement Lead for Medicines Safety for NHS England and NHS Improvement:

“[Aildred’s] research allowed us to understand that there was a gap around how the administration of medicine in care homes could be supported and improved. This directly led us to design a national project with the Patient Safety Collaborative, and the Academic Health Science Network was commissioned to look for positive interventions that could make a significant difference to the administration of medicine in care homes. The Patient Safety Collaborative produced a national report, and this report in addition to the CHUMS and CHIPPS research was instrumental in our understanding the situation. Most recently we have commissioned the Patient Safety Collaborative over the next 18 months to take forward tests of interventions that can be done in care homes, all aimed at administration in medicine, and your research is to thank for this. If your research into CHUMS and CHIPPS had not been carried out, we would not be investing the amount that we are investing in medicine safety in care homes over the next 18 months. It has been instrumental in changing the safety of medicine administration in care homes both now and in the future” [K].

5. Sources to corroborate the impact (indicative maximum of 10 references)

- A. Centre for Postgraduate Pharmacy Education (CPPE), 2020 [current version]. Care homes: supporting people, optimising medicines. <https://www.cppe.ac.uk/programmes//suppcarehome-e-00>
- B. Joint testimonial from the CPPE Director, Head of National Pathways, and Senior Pharmacist for the CPPE Medicines Optimisation in Care Homes training pathway
- C. National Institute for Health and Care Excellence (NICE), 2014. Managing medicines in care homes SC1. <http://www.nice.org.uk/guidance/sc1>
- D. NHS England Medicines Optimisation in Care Homes (MOCH) Programme, 2018. <https://www.england.nhs.uk/publication/medicines-optimisation-in-care-homes-programme-overview/>
- E. Testimonial from the NHS Care Homes Pharmacy Lead, NHS England
- F. NHS England, 2019. The NHS Long Term plan <https://www.longtermplan.nhs.uk/>
- G. NHS England and NHS Improvement and the BMA, 2020. Investment and Evolution: Update to the GP contract deal: 2020/21-2023/24 <https://www.england.nhs.uk/gp/investment/gp-contract/>
- H. Policy Research Unit in Economic Methods of Evaluation in Health and Social Care Interventions, 2018. Prevalence and Economic Burden of Medication Errors in the NHS in England <http://www.eepru.org.uk/wp-content/uploads/2020/03/medication-error-report-edited-27032020.pdf>
- I. NHS England and NHS Improvement, 2019. The NHS Patient Safety Strategy. https://improvement.nhs.uk/documents/5472/190708_Patient_Safety_Strategy_for_websi_te_v4.pdf
- J. WHO, 2017. Global Patient Safety Challenge: Medication without Harm. <https://www.who.int/patientsafety/medication-safety/en/>
- K. Testimonial from the Clinical Improvement Lead for Medicines Safety for NHS England and NHS Improvement