Antibiotic Research in Care Homes (ARCH): Key findings and implications for policy

Introduction

A key public health priority is the reduction of antibiotic use to tackle antibiotic resistance. Care homes for older people is a critical sector, serving a vulnerable population with high rates of antibiotic use and resistance, that is currently underserved by research and innovation.

The Antibiotic Research in Care Homes (ARCH) study took a multidisciplinary approach to understanding and addressing this issue by engaging with multiple organisations and stakeholders in the care home sector. This approach recognises the importance of understanding the care home context, including variation across different care home settings and professional roles and responsibilities of care home staff, as a basis for supporting innovation in antibiotic stewardship.

Why did we do this research?

Antibiotic use contributes to antibiotic resistance, which is a growing public health threat and priority. Residents of care homes for older people have high rates of antibiotic use and resistance, with substantial variation in antibiotic use between care homes. The COVID-19 pandemic highlighted the importance and the vulnerability of care home organisations and their residents but there has been limited research working with care homes to generate evidence on effective strategies for improvement. ARCH addressed this gap by focusing on antibiotic use in care homes, which is highly relevant to the World Health Organisation (WHO) and UK government priority area of antimicrobial resistance (AMR). The findings also have wider implications for service development in the current establishment of National Care Services in the UK.

What did we do?

There were three main phases in the ARCH study, as shown in Figure 1.

Figure 1. Flow diagram of main phases of ARCH

Phase 1 of the ARCH study involved statistical analysis of anonymised data from all 148 eligible care homes for older people in two NHS Scotland territorial Health Boards to calculate antibiotic prescribing rates in different care homes, and resident and care home factors (e.g. age of resident, size of care

home) affecting these rates. We then worked with care home managers, staff, residents and their relatives from seven of these care homes, and with general practitioners (GPs), Advanced Nurse Practitioners (ANPs) and community pharmacists who provided healthcare services to these homes, to collect more detailed information on how potential bacterial infections were identified and managed in these settings. This involved observations of their everyday work, interviews and surveys to better understand what influences antibiotic use in care homes. In Phase 2, we integrated the findings from these different sources to generate recommendations for a support package to improve antibiotic use in care homes. We then presented and discussed these in a workshop with care home staff, residents, and their carers.

In Phase 3, the support package was tested in two care homes, and we collected additional feedback using focus groups and interviews on what people thought of the package and any challenges in translating this into practice. While the restricted geographical area necessitates some caution around generalisability, the statistical analysis included a complete area population and there were >150 participants in the qualitative case studies. Our findings are consistent with the limited existing literature and resonated with a broader group of 60 policy and practice stakeholders across two dissemination meetings held in June 2022.

What did we find?

1. There was wide variation in antibiotic prescription rates between care homes (from <3 to >20 prescriptions per 1000 resident bed days) that could not be fully accounted for by resident, care home or general practice factors available in the statistical analysis. However, the care home a resident lived in had more influence on rates of antibiotic prescription than the GP practice the resident was registered with. This aligns with ARCH observation and interview findings that most of the process involved in an antibiotic prescription being written takes place in the care home, as shown in Figure 2, with practices and culture varying between care homes. This highlights the important role of staff and everyday routines and practices within individual care homes in influencing antibiotic prescribing.

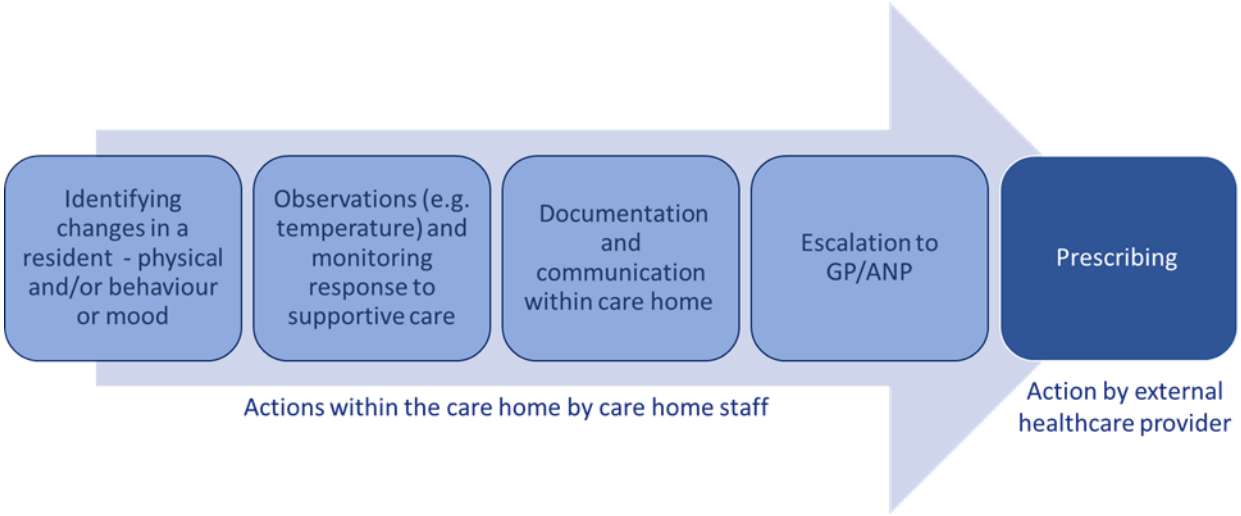

Figure 2. Process involved in an antibiotic prescription being written for a care home resident

2. Antibiotic prescribing is the end point of a process involving multiple stages of complex and highly skilled informal diagnostic work undertaken by carers and the onward communication to GP practice teams (Figure 2). The importance of this role, drawing on carers' knowledge of their residents, was not fully recognised by care home staff themselves or other stakeholders.

3. Providing safe, high-quality care, and improving care for their residents are the highest priorities for all care home staff. However, lack of specific knowledge and training around infections, antibiotics and antibiotic resistance, reduced opportunities for training due to staff shortages and high staff turnover, and restrictions around roles and responsibilities, were among the reported barriers to supporting appropriate antibiotic use (antibiotic stewardship).

4. A co-designed intervention package consisting of tools to support the assessment and monitoring of residents with suspected infection and communication within the care home and with GPs and ANPs, training videos, and appointing staff as Antibiotic Champions, received positive feedback regarding acceptability and feasibility, but opportunities for formal testing in practice were limited by staff shortages exacerbated by the COVID-19 pandemic.

What are the Policy Implications?

1. The unexplained variation in antibiotic prescribing rates between care homes indicates scope for reduction in prescribing and highlights the need for stewardship. Opportunities and approaches identified in ARCH, shown in Figure 3, could facilitate the design and implementation of stewardship interventions.

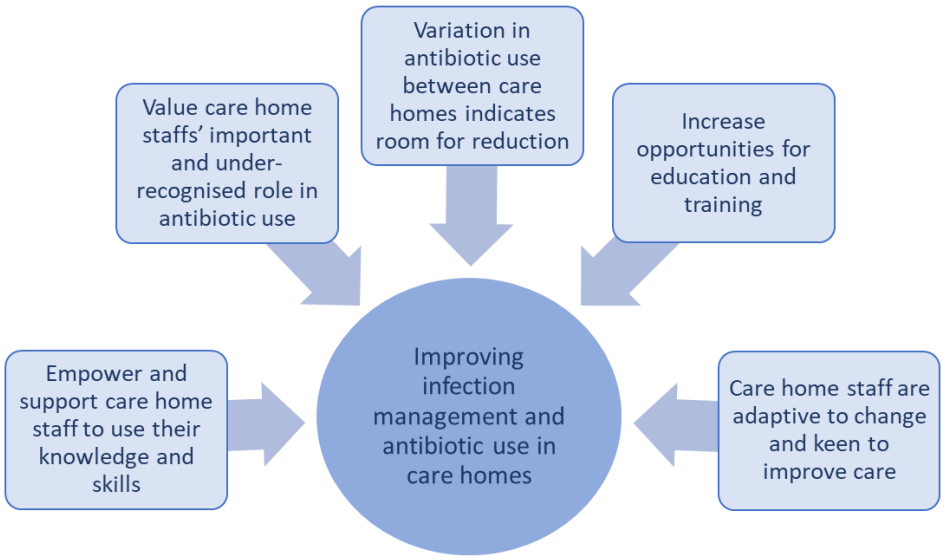

Figure 3. Opportunities and approaches for improving infection management and antibiotic use in care homes

2. Antibiotic stewardship in care homes requires a systems approach that targets actions beyond prescribing, involves all stakeholders (managers, nurses, carers within the home, residents, family, prescribers (GP/ANP/pharmacists), community pharmacists and organisations (care homes, GP practices/clusters, ANP hubs, care home groups, policy level (such as the Care

Inspectorate), and seeks to understand the relationships, interactions, and communication between them.

3. Education and training on the holistic assessment of unwell residents and on the advantages and disadvantages of antibiotic use are required to reduce the fear of "missing something", the prescription of "just in case" antibiotics and to ensure prompt management of residents who may have a potentially serious infection. Training must fit within existing statutory requirements, be consistent across the sector and should integrate with other quality improvement initiatives.
4. Interventions need to strike a balance between being very directive, supporting staff who are not clinically trained, and empowering staff to use their knowledge and skills which needs demonstrable organisational support at all levels. Interventions also need flexibility to contextual variation across care home settings.
5. The findings have implications for implementing change or improvement in the care sector beyond stewardship, including the planned establishment of National Care Services by the Scottish Government and Welsh Government. Implementation should take the same systems approach, valuing and engaging all stakeholders.

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Charis Marwick researches antibiotic use and resistance, working with multidisciplinary teams to improve appropriate use of antibiotics to reduce resistance. ARCH was a collaboration with University College London Centre for Behaviour Change, University of Edinburgh and Queen's University Belfast and was funded by funded by the Economic and Social Research Council (ESRC) led theme of the Antimicrobial Resistance Cross Council Initiative supported by the seven UK Research Councils in partnership with other funders. The views expressed in this document are those of the author and the research team and not necessarily those of the University of Dundee, collaborating institutions or the ESRC.