Study record 39373

Results and Publications

Results (plain English)

Background

The CONTACT study was funded by the National Institute for Health and Social Care Research as part of its COVID-19 "Recovery and Learning" programme. COVID-19 was responsible for 45,632, or 16.7% of all deaths of care home residents in the pandemic and infection control and regular testing were crucial for managing COVID-19 in care homes. At the time of funding, people coming in and out of homes (including staff) were a possible source of outbreaks and transmission.

Contact tracing was an important part of public health efforts to contain the spread of COVID-19, especially before the development of the COVID-19 vaccine. Conventional contact tracing relies on people recalling their contacts with others. This does not work in care homes because many residents have dementia and staff have many contacts in a working day. Using smartphones for contact tracing - like NHS Track and Trace – is also unlikely to work in care homes because not many residents use smartphones and staff are often discouraged from using their phones at work. An alternative approach to contact tracing is wearable digital devices that use Bluetooth to identify each other and record contacts. These are known as BLuetooth Enabled or BLE wearables. Care home teams could potentially use the information produced from BLE wearable data to target infection prevention and control where it is most needed. This could mean avoiding having to impose restrictions such as "lockdowns" on entire homes.

This study constitutes the first important step in evaluating the potential of this intervention. Our main objectives were to evaluate the acceptability and feasibility of the CONTACT intervention and study processes in the homes.

Methods

We planned to examine the effects of our intervention upon COVID-19 infections by comparing homes using our intervention with those that were carrying out their infection prevention and control as usual (ie. without using BLE wearables) in a larger experimental study. However, we first needed to carry out a smaller study in a few homes to examine the feasibility and acceptability of the BLE wearables, feedback reports and study procedures.

This feasibility study was conducted in four care homes over two months between November 2021 and April 2022. Alongside our feasibility study we explored the ways that the intervention and study procedures were delivered in the homes (this is called a process evaluation). In partnership with our Study Steering Committee, which included members of the public with caring and care industry experience, we set progression criteria that were classed as green (a positive result) to red (a negative result) to help us decide whether continuing to a larger and expensive main study was justified. Green or amber criteria meant it might be, red that it was most likely not.

The intervention was small, BLE wearables, in either a round fob or credit card form, worn by the residents, staff and visitors in care homes. We also placed BLE "marker" devices at strategic

locations in each home. Data from the devices were analysed and presented back to homes in two ways: first, as a monthly (scheduled) feedback report on patterns and trends in contacts, infections and infection risks; and second, as a list of contacts with any positive cases that homes told us about. We called each home each week to support their use of the reports and help us with the work needed to complete the study. Each home was asked to recruit a "champion" from their staff to help deliver the study. Training (in person or online) in study procedures and BLE device care was provided to each home.

We used different methods to capture data. These included interviews with staff and residents; data from the BLE devices and analysis; observing staff and residents wearing the devices; a questionnaire (called NOMAD) examining readiness for new things (innovations) in the home based on a theory of how technology becomes part of everyday work (Normalisation Process Theory); notes from meetings and phone calls with homes; and a study case report form that homes filled in each week. We simulated the ways that the technology was being used in the homes to examine how well the technology *could* work if it was implemented well. We analysed the data in ways that included interpreting the qualitative findings of interviews, notes and observations; and counting, summarising and describing averages and spread of the quantitative routine and questionnaire data. We were also able to calculate the financial cost of the intervention from the perspective of each home, and calculate measures to help us understand the social networks that existed in each home.

Results

Four care homes in North and West Yorkshire took part. They varied in size from 15 to 102 residents and 21 to 120 staff. Two homes provided nursing care, two did not. Staff told us between 13% to 20% of residents had a diagnosis of dementia. Homes were all rated "Good" by the Care Quality Commission. 98 of 102 registered residents (ranging from 87% to 100% of registered residents in homes) and 155 of 158 registered staff were issued with CONTACT BLE devices. On average, residents were aged 85 years old (standard deviation [s.d.] 8.97); 26% were men and 74% women; all viewed their ethnicity as "white". The average age of staff was 41 years (s.d. 14.62); 11% were men and 88% women; most were employed in direct care (45%) or specialist clinical (23%) roles. Staff mostly worked 12-hour shifts for 3 days a week on average and 75% of staff were employed on day shifts. Less than 1% of staff said they worked in more than one home. Almost all the residents and staff had received the coronavirus vaccine by the time the study started.

Was the CONTACT intervention acceptable and feasible?

Ten percent (n=10) of residents stopped wearing their devices during the study period; but this ranged from none in one home to more than a third in another. Reasons why included simply not wanting to wear a device, to confusion and distress from the wearable. Only 5 staff (3.2%) stopped wearing their devices in the study period. Reasons why included, "not wanting to wear it" to it, "getting in the way". Residents' devices got lost (11%, n=12, range 0% to 19%) or damaged (6.5%, n=7, range 0% to 24%). Amongst staff, 3% of devices (n=5, range 0% - 5%) were lost and 4% (n=7, range 0% to 6%) of devices damaged.

The monthly CONTACT scheduled report was generally viewed positively and judged by staff as easy to understand; although contact patterns over time and infection risk information on residents was judged difficult to understand by one home manager. Staff told us the report was unlikely to help, "thinking about infection control processes" and managers said they were unlikely to implement changes based on the report; the only exception being the single home that was "likely" to instigate change based on analysis of outbreak details. The follow up calls that we carried out after the

scheduled reports were viewed as very/extremely useful by 3 homes. Our progression criterion related to acceptability was **not** met: only 63% of eligible residents (rated amber) and 68% of staff (rated amber) consented to wear a device, were issued one and wore it consistently throughout the study. For CONTACT tracing to be effective at least 70% of a community needs to take part.

Implementation of the technology was important for the intervention to have a chance of generating reliable and trustworthy data. All four homes found this challenging, however. The quality of the data that we received from the devices varied across the participating homes. In one home 83% of resident devices consistently produced data over the two months; in another, only 11% of devices produced data that indicated residents were wearing devices routinely. Staff-worn devices also varied from 38% of issued devices recording data as expected, to only 6% in one home.

Our process evaluation revealed that home staff recognised that CONTACT was a new way of working but – apart from Home 3 - got used to it. Homes 1 and 2 understanding of the study did not really develop, while Homes 3 and 4 had a better understanding over time. All homes saw potential benefits, but Home 3 was unsure as time went on. Most homes were open to continued working on CONTACT, but Home 4 was less willing to continue the study. Homes 2 and 4 found it hard to include CONTACT work in their daily tasks. CONTACT did not cause issues in working relationships, but there were doubts about non-managers' ability to use the technology for decision making. Homes 3 and 4 were negative or indifferent about giving study tasks such as completing case report forms (CRFs) to staff. All homes felt they received enough training, and their management supported the study. The homes declined to issue devices to visitors and agency staff in the study period because they judged the "paperwork" (study registration procedures) as too burdensome. In interviews, staff generally failed to see any advantage to the CONTACT intervention beyond normal infection control and felt it added extra work for little tangible benefit. Residents generally didn't understand what the BLE wearables were for. Some understood it was, "something to do with COVID". The (triggered) report of contacts with infected residents was seen as useful, but served to confirm opinions in staff rather than inform infection preventative behaviour or policy. The success of the vaccination programme meant that only two of the homes had cases of COVID-19 and asked for a report in the two months of the study. Our analysis of the costs of the CONTACT system was a cost-per-participant of £176.53 per year (less than £15 per month) in the first year (with higher set up costs and initial equipment and training), dropping to £164.39 per staff or resident after the first year (less than £14 per month).

Our simulation-based technical evaluation of the potential of the technology showed that the wearable system correctly identified contacts (a contact being two devices at a distance of <2 metres and for more than 14 minutes) 75.5% of the time; in other words, for every 100 contacts recorded, around 25 will be false positives. This rises to 81.5% under ideal conditions with no obstructions between devices, such as a wall or where one of the devices is in a pocket or handbag.

Conclusion

Overall, the CONTACT study's BLE wearable approach did not prove feasible in real world care home conditions. The technology worked as intended, and still has potential for describing contacts and social networks in homes, but the implementation of the CONTACT system alongside the requirements of a research study in each home proved too challenging. Study-related activities for already over-stretched staff were judged too onerous. The absence of COVID-19 cases resulting from the timing of the study (post successful vaccination programme) meant that positive feedback from the information produced by CONTACT was too limited and so learning to use the technology in everyday work was hindered.