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Increasing vaccination: reminders work, and a behaviourally-informed chatbot works better

Submission date
03/06/2024

Recruitment status
No longer recruiting

Registration date
07/06/2024

Overall study status
Completed

Last Edited
17/07/2026

Condition category
Infections and Infestations

[_] Prospectively registered
[X] Protocol
[_] Statistical analysis plan
[X] Results
[_] Individual participant data

Plain English summary of protocol
Background and study aims
In this study, a new chatbot will be designed and tested to understand whether two-way interactive messaging incorporating behaviourally-informed functionalities could perform better than one-way message reminders. A large-scale pre-registered randomly allocated and controlled trial will be performed with 249,705 participants in Chaco, Argentina, measuring vaccinations using Ministry of Health (MoH) records. Randomisation will be conducted at the individual level, with one-third of the sample (83,235 participants) assigned to receive the WhatsApp chatbot, another third to receive a single one-way WhatsApp message encouraging them to get the next dose of the COVID-19 vaccine, and the final third of the sample to receive no message (the control group).

Who can participate?
Adults aged 18 years old and over who had received at least one dose of the COVID-19 vaccine

What does the study involve?
Participants for the trial will be selected from one of three phone databases owned by the MoH. The study is a three-arm trial using data from MoH records to test whether a chatbot can increase vaccination more than a one-way message reminder or no message. Participants in the WhatsApp chatbot group received interactive messages incorporating several functionalities based on insights from behavioural science. First, they will receive individual-level personalised information on their eligibility based on the government's vaccination database. Second, they could use a locator tool to find their nearest vaccination centres based on their postcode or by using WhatsApp's 'Share Location' functionality. Third, they will be prompted to make a plan for when and where they will get vaccinated. Fourth, they will receive a reminder message the day before their chosen date, and fifth, they will be provided a link with Google Maps directions on how to get to their chosen centre. In each case, users can reply to the chatbot's messages by choosing an answer from a set menu of options. Participants in the one-way message group receive a single WhatsApp message encouraging them to get the next dose of the COVID-19 vaccine. Participants in the control group will not receive any messages.

What are the possible benefits and risks of participating?
Potential participation benefits include receiving personalized information regarding COVID-19

vaccination eligibility, vaccination centres, and reminder-setting, which aims to promote vaccination outcomes. No anticipated major risks associated with participation are expected. The risk that participation may yield a lower vaccination outcome will be minimised by developing the messages based on qualitative research with the target population in Chaco, Argentina, as well as input from experts and consultations with the Government of Argentina's Unidad de Ciencias del Comportamiento y Políticas Pública.

Where is the study run from?
Chaco, Argentina

When is the study starting and how long is it expected to run for?
September 2021 to December 2022

Who is funding the study?
1. Vaccine Confidence Fund
2. Inter-American Development Bank

Who is the main contact?
1. Dan Brown, dan.brown@cantab.net
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Contact information

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Scientific, Principal investigator

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Additional identifiers

Protocol serial number
AEARCTR-0009758

Study information

Scientific Title
Original Title for Pre-Registration: Implementation of a Chatbot Based on Behavioral Strategies to Promote Continuity of COVID-19 Vaccination: A Randomized Controlled Trial.

Current Title: Increasing vaccination: reminders work, a behaviourally-informed chatbot works better.

Study objectives
Participants who receive personalized WhatsApp chatbot messages informed by behavioral principles will exhibit a higher rate of COVID-19 vaccination during the 4-week period following the intervention compared to each of the two comparison groups (one group receives a one-way message reminder, and the other receives no message).

Ethics approval required
Ethics approval required

Ethics approval(s)
Approved 29/06/2022, Comité de Bioética, Hospital Universitario Fundación Favaloro (Bioethics committee, Favaloro Foundation University Hospital) (Av. Belgrano 1746, Buenos Aires, C1095, Argentina; +54 11 4378-1229; comitedebioetica@ffavaloro.org), ref: CBE Acta 121 29/06/2022

Primary study design
Interventional

Study design
Naturalistic randomized controlled trial

Study type(s)
Efficacy

Health condition(s) or problem(s) studied
Promotion of COVID-19 vaccination in the general population

Interventions
Participants in the treatment group will receive personalised WhatsApp chatbot messages informing them they are eligible for the next dose with a motivational message leveraging loss aversion (“don’t lose your immunity”), sharing practical information on when and where to get vaccinated, providing planning prompts, and enabling them to set reminders to get their next dose of the COVID-19 vaccine on a convenient date. Participants in the one-way message control group will receive a single WhatsApp message (i.e., a message they cannot interact with) informing them they are eligible for the next dose and with a motivational message leveraging

loss aversion (“don’t lose your immunity”). This single message is identical to the first communication of the treatment chatbot. Finally, participants in the control group do not receive a message.

Randomisation will be conducted at the individual level, with one-third of the sample (83,235 participants) assigned to receive the WhatsApp chatbot, another third to receive a single one-way WhatsApp message encouraging them to get the next dose of the COVID-19 vaccine, and the final third of the sample to receive no message (the control group). The unit of randomisation is the individual as identified by their national ID number. Using a random number generator, participants are assigned to one of three groups (chatbot group, one-way message reminder group, control group), and stratified by the number of COVID-19 vaccine doses already received by the individual (1, 2, 3 or 4).

Intervention Type
Behavioural

Primary outcome(s)
Next dose vaccination rate, indicating whether the individual received the next dose for which they are eligible, measured using administrative data provided by the Ministry of Health which includes information on the date of vaccination within four weeks of entering the trial

Key secondary outcome(s)
There are no secondary outcome measures

Completion date
31/12/2022

Eligibility

Key inclusion criteria
Individuals from Chaco province, Argentina, will be included in the trial if:
1. They are aged 18 years old and over
2. Have received the first COVID-19 vaccination dose
3. Are eligible to receive their next COVID-19 dose (i.e., 2nd, 3rd, 4th, or 5th dose of the COVID-19 vaccination)
4. Have a valid mobile number registered within the database
5. Their mobile number is registered with WhatsApp
6. The mobile number is unique to one individual within the database

Participant type(s)
Population

Healthy volunteers allowed
No

Age group
Mixed

Lower age limit
18 Years

Upper age limit
110 Years

Sex
All

Total final enrolment
249705

Key exclusion criteria
Not meeting the participant inclusion criteria

Date of first enrolment
08/09/2022

Date of final enrolment
21/09/2022

Locations

Countries of recruitment
Argentina

Study participating centre
Ministerio de Salud
Provincia de Chaco (Chaco Province Ministry of Health)
Argentina
3500

Sponsor information

Organisation
The Behavioural Insights Team

ROR
https://ror.org/03mk5b468

Funder(s)

Funder type
Charity

Funder Name
Vaccine Confidence Fund

Alternative Name(s)
The Vaccine Confidence Fund, VCF

Funding Body Type
Private sector organisation

Funding Body Subtype
Other non-profit organizations

Location
United States of America

Funder Name
Inter-American Development Bank

Alternative Name(s)
Inter American Development Bank, Banco Interamericano de Desenvolvimento, Banque Interaméricaine de Développement, , Banco Interamericano de Desarrollo, IADB, IDB, BID

Funding Body Type
Private sector organisation

Funding Body Subtype
International organizations

Location
United States of America

Results and Publications

Individual participant data (IPD) sharing plan
The anonymity-preserving data used in the analysis are publicly available in the Dryad data repository at the following link: https://datadryad.org/stash/share/HPMMIkG8ltPniOJJChLa6ci81SaDKXK24I68g8njXCk.
Note: No accession code is required.

IPD sharing plan summary
Stored in publicly available repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article		18/10/2024	17/07/2026	Yes	No
Protocol file		11/07/2022	17/10/2024	No	No