



Editorial

COVID-19 Vaccination. Where Are We and Where Should We Go?

Vacunación contra la COVID-19. ¿Dónde estamos y adónde debemos ir?



The vaccination process goes beyond the technical action of administering a drug¹; it is one of the activities within the intervention “immunization/vaccination management”² in the face of the diagnosis of “infection risk”.³ It is a complex procedure that must include planning framed within a global public health strategy, with the aim of improving “health promotion behavior”.⁴ It must always end with the record in the person’s clinical history, indicating whether it has been completed with the unequivocal data of the drug administered or the rejection and the reasons for it.

In the first week of March 2022, in Spain, 91.1% of the population aged 12 years or older was vaccinated with the complete schedule, 86.0% of the population aged 5 years or older, and 82.5% of the total population. However, only 51.1% of the population aged 20 years or older have the booster dose.⁵

In Cantabria (autonomous region of Spain [ARS] with a total population of 584,507 inhabitants), 92.9% of the population aged 12 or older has the complete guideline, corresponding to 85.6% of the total population, which places it in the 5th ARS with the highest percentage of vaccination. In the booster dose to the population aged 20 years or older, the number of vaccinated rises to 60.9%.

These favorable data may be due to the methodology used in Cantabria, where since the beginning of the pandemic there has been a commitment to improve accessibility and respond to the needs of citizens through a contact center called *Salud Cantabria Responde* [SCR]. The service began operating on March 13, 2020 and is currently included in the innovative digital health project to be developed. It is a transdisciplinary service, led by Nursing, which incorporates the use of digital transformation tools to face new health challenges.

Methodologically, before any intervention, it is essential to carry out a correct assessment to have an objective that can be evaluated. In the case of vaccination against SARS-CoV-2, it is essential to identify the people who are candidates to be vaccinated to prevent a risk to public health such as COVID-19. Therefore, the DIANA program was developed as a sociodemographic database with the total population of Cantabria and interconnected with the clinical history. DIANA provides personalized information on the vaccination status against SARS-CoV-2, episodes of COVID-19, and clinical vulnerability to select candidates to receive vaccination according to the COVID-19 Vaccination Strategy in Spain.⁶

In the same way, the DIANA program allows to filter clinical and age conditions to extract lists of people who are candidates for vaccination. Therefore, the appeal is a proactive intervention by the

health system, providing confidence and individualization within the vaccination campaign. Due to the high amount of people to be vaccinated in a short space of time, SCR used JANO, a virtual voice assistant capable of initiating 100 calls per minute.

The bot personalizes the intervention, and after the call encodes the result. In this way, people who accept the appointment will obtain a specific place, day, and time, avoiding collapse at the vaccination points. On the other hand, it will discriminate the reasons for not accepting the appointment, so that it can be analyzed manually by a health professional (rejection and inclusion in clinical history, clarification of doubts, etc.), or remain as a candidate again to receive the appointment, for those not having accepted the appointment at the proposed time and place.

During the booster dose vaccination campaign in Cantabria, JANO has achieved 213,303 appointments, completing 75.44% of the proposed schedules after 554,571 calls. It has been necessary to contact an average of 2.67 people to achieve a confirmed appointment. The coding has allowed the health team to act early and individually on the 1764 undecided people and the 10,780 who referred to the bot that they did not want to be vaccinated, and provided personalized health education to improve adherence to vaccination.

The rejection of the booster dose by the Spanish population, according to the study coordinated by the Carlos III Health Institute, is 7%.⁷ In Cantabria, rejection of the booster dose is 5.08%.

The data currently available on the development and implementation of virtual technologies are encouraging. SCR is progressively consolidating itself in the population, thanks to its accessibility and its innovative health service. It would be important to know the amount of people getting a confirmed appointment with a human administrative operator, to compare it with the 0.96€/appointment of the average cost of the bot. We must be aware of the value of human and material resources to evaluate the procedures in searching for continuous improvement.

Eventually, we must be able to adapt to social reality and communicate properly by using strategic media and channels. The information policy should be adapted according to the determinants of health, since once again they are key in behavior before vaccination.⁸ The use of natural language processing and machine learning techniques can accelerate the maturation process of understanding public opinion and be effective in text analysis for rapid studies of large data sets from social networks. With all this, it could be investigated whether there is an optimal period in which

the information can be presented in real time to create a positive influence and maintain it active in people's memory.⁹

There are many doubts about where we should go in vaccination, but we cannot have them about whether health professionals should lead the digital health transformation, based on efficient clinical management. Are we ready for it?

References

1. Palop Muñoz J, Santonja Pastor T, Montón Campos J, Giménez Campos S, Geraldo Pérez P, Viudes E. El proceso enfermero en la administración de vacunas. *Metas Enferm*. 2011;14:27–31.
2. Butcher HK, Bulechek GM, Dochterman JM, Wagner CM. *Clasificación de Intervenciones de Enfermería (NIC)*. 7th ed. Madrid: Elsevier; 2018.
3. NANDA Internacional. *Diagnósticos enfermeros. Definiciones y clasificación*. 2021–2023. 12th ed. Madrid: Elsevier; 2021.
4. Moorhead S, Swanson E, Johnson M, Maas ML. *Clasificación de Resultados de Enfermería (NOC). Medición de Resultados en Salud*. 6th ed. Madrid: Elsevier; 2018.
5. Gobierno de España, Ministerio de Sanidad. Ministerio de Sanidad – Profesionales – Cuadro de mando abstract de datos de vacunación. 2022. Available from: <https://www.sanidad.gob.es/profesionales/saludPublica/ccayes/alertasActual/nCov/pbiVacunacion.htm> [accessed 9.3.22].
6. Gobierno de España, Ministerio de Sanidad. *Estrategia de Vacunación COVID-19 en España*. 2022. [accessed 11.3.22].
7. World Health Organization, Regional Office for Europe. *Monitorización del comportamiento y las actitudes de la población relacionadas con la COVID-19 en España (COSMO-SPAIN): Estudio OMS*. 2022. Available from: <https://portalcne.isciii.es/cosmo-spain/> [accessed 11.3.22].
8. De Andrés Sánchez J, Arias-Oliva M, Pelegrín Borondo J, Lima Rúa O. Factores explicativos de la aceptación de la vacuna para el SARS-CoV-2 desde la perspectiva del comportamiento del consumidor. *Rev Esp Salud Pública*. 2021;95:e202107101.
9. Povedano Álvarez D, Portela García-Miguel J, Armas Vega EA, Povedano Álvarez D, Portela García-Miguel J, Armas Vega EA. Estudio de la percepción pública de la vacuna contra la COVID-19 mediante técnicas de PLN y de aprendizaje automático; 2021. Available from: <https://eprints.ucm.es/id/eprint/67617/> [accessed 9.3.22].

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