

# Bluebird

## Immunization Information System (BlueIIS)



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## Introduction

The national COVID-19 vaccine rollout on the scale required during this emergency will be an ambitious undertaking especially for a country where parts of our public health system are already buckling under pressure from the coronavirus pandemic.

Supply chain security and product verification rank high on a long list of challenges and, without a reliable *system* to manage risk, one opens the door to fake vaccines, theft, hijacking and illegal product diversion. An ability to guarantee that every COVID-19 vaccine given is legitimate and from a controlled supply chain will be critical in gaining the trust of the public which is essential in ensuring the success of this enormous undertaking. Bluebird's business intelligence tools provide views of vaccine availability at facility, district, province, and national levels along with stock outs at any point in the supply chain.

Pairing vaccinators with vaccine recipients and auditing COVID-19 vaccination and adverse events will be another significant logistic challenge.

The **Bluebird Immunization Information System** (BlueIIS) is a secure, comprehensive, digital COVID-19 vaccination platform for integrated COVID-19 vaccine distribution, delivery, immunization and monitoring of adverse events. Real-time monitoring of all processes provides accountability. The entire process from vaccine manufacturer to post vaccination surveillance is monitored allowing for visibility throughout the supply chain. If the scan doesn't happen at any point, the system "flags" and investigations begin immediately. BlueIIS utilizes both **Serialization** and **Traceability** and gives government and the public a sense of **trust in the processes**. Traceability reduces falsification, enables precise product identification and facilitates both recalls and adverse event reporting. Falsified and substandard vaccines never reach their destination because investigations and subsequent action by the authorities remove them from the logistic pipeline. If theft happens, it is detected quickly. Authorities can identify shipments wherever they are in the supply chain, and there's assurance that the right products reach the right people because there's end-to-end visibility.

By reducing a vaccinator's need for manual processes and data entry and enabling real-time monitoring of shipments and inventory, BlueIIS dramatically improves the efficiency of the entire process.

BlueIIS empowers government by providing a critical enhancement to our nation's ability to respond to this public health crisis.

BlueIIS does this by streamlining data on Covid-19 vaccine procurement, distribution, circulation, storage and dose schedules besides also notifying the first sets of vaccine recipients when their shots have been scheduled. The app will enable authorities right down to the grassroots level to upload and access data on a real time basis and provide updates to those on the priority list on when their shots are scheduled and who will administer them.

Once both doses of vaccine are administered the BlueIIS will also generate an immunization certificate and store it on the recipient's behalf.

## Why should Bluebird be trusted to help co-ordinate the National COVID-19 Vaccine Roll-Out?

- Our capabilities and work ethic are well known to the NDoH
- We have a proven track record of providing a professional, cost-effective service at scale. We recently passed a detailed AG audit with flying colours
- Bluebird can provide a sophisticated and immensely scaleable pre-vaccination registration and appointment system which we believe is a needed early step
- We will also provide an enrolment/registration system for vaccination distributors and providers
- The current Bluebird reporting system can quickly be repurposed to produce all the reports specified in the current NDoH roll-out documentation
- Bluebird has an established API which the NDoH is already set up to use and which shares raw data in real-time
- Bluebird's real-time integration with lab results can immediately alert the NDoH if any vaccinated person subsequently tests positive for COVID-19
- We can provide auditable traceability of vaccine distribution and injection in real-time. Our team has extensive experience with the bar code scanning technology that powers verification of vaccines distributed vs volumes administered
- Bluebird's ability to guarantee every COVID-19 vaccine is legitimate and from a controlled supply chain will be crucial to tackling this virus and vital to address supply chain security
- Bluebird will monitor vaccine wastage each day and report wastage by vaccination centre
- The BlueIIS can easily import data from Persal, HPRS, SASSA, HPCSA etc.
- Bluebird can provide detailed real-time actionable information to the MAC to help guide allocation of vaccines to the various priority groups
- The Bluebird vaccine safety surveillance system will continuously monitor vaccine safety. I am worried that the MedSafety app will not prove helpful in SA. The Bluebird electronic reporting system will display the core variables required to help the National Immunisation Safety Expert Committee (NISEC) make difficult decisions. That raw data will also be available, in real-time, via the existing Bluebird NDoH API
- Bluebird already has an established Adverse Events Reporting System for the 72 hospitals we service - this solution can quickly be repurposed for AEFI.
- This will enable Bluebird to report on the consequences of the inoculations, side effects, efficacy, amount of time it takes to develop antibodies etc. All according to different types of population, age, gender, pre existing conditions ...
- Bluebird can manage the log in credentials or do that via the NDoH active directory
- BlueIIS is astonishingly cost-effective with a path to full government ownership

## Company Background

Bluebird is a proven, battle-tested, secure medical information system successfully used by more than 70 hospitals, including the **Nelson Mandela Children's Hospital** and the **Christiaan Barnard Memorial Hospital**, and more than 200 ICUs (including the **largest ICU in the Southern hemisphere**). Bluebird has proved invaluable in managing other national infectious disease threats including high mortality infections such as CRE and Candida Auris.

That **proven industrial capability** allowed the Bluebird team to rapidly offer a comprehensive service to the NDoH during the COVID-19 Pandemic.

Intelligent Medical Systems (IMS), the company behind Bluebird, was uniquely positioned to deliver a comprehensive solution to government both in terms of **real-time surveillance** as well as **individual case management**.

Their 25-year experience in professionally integrating data from disparate medical information systems (such as all the laboratories in South Africa and multiple medical facilities) into a single, secure platform, allowed Bluebird to immediately provide a consolidated view of national COVID-19 information. Importantly, Bluebird facilitated data entry both automatically via APIs and manually by NDoH staff. That data access was role based with, for example, the Minister of Health having national access while a district health nurse would only see local district information. Because Bluebird is cloud based, no software installation or server management by the NDoH was required.

The unified Bluebird Health Platform provided the NDoH the ability to **actively manage** Persons Under Investigation (patient demographics, co-morbidities, symptoms and isolation/quarantine decisions, ICU parameters including ventilator use, outcomes etc.), perform contact tracing and to intelligently analyze comprehensive data and then make that information available in near real-time to the Minister of Health and NDoH Users.

Intelligent Medical Systems' unique ability to rapidly provide this service is explained by their long and unblemished track record both in terms of data integrity as well as patient confidentiality and the robustness and scalability of the Bluebird Health Systems.

In March 2020 they were the only entity in Africa capable of integrating all the private and public testing facilities in near real-time and making those statistics immediately available to the Minister and the NDoH. The Bluebird Health Platform had provided a lab integration service since 1995 and has developed **deep operational experience** over more than two decades. That capability was not something that could easily be emulated during a global emergency.

## Bluebird Company History

The company history is important in demonstrating IMS's prolonged and consistent ability to provide this service to the medical profession:

In 1994, the Bluebird founder Dr. D.G. Vine developed the first commercial Electronic Medical Record that ran on Microsoft Windows. A significant number of South African doctors are still using that ground breaking EMR 25 years later. In 1997 Dr. Vine developed the first system that integrated all the private lab results in South Africa and thereafter he directed the development of the Bluebird cloud based Hospital Information System. Dr. Vine is a Fellow of the Royal College of Surgeons of Canada and has a strong academic background.

IMS's CTO and their Hospital Division Manager have both been with IMS for more than a decade. This deep experience is important because it underpins our ability to deliver.

In 1999 the information technology giant, Datatec, acquired a significant shareholding in IMS and from that partnership IMS inherited an **industrial capability** to run Bluebird at scale. No other national solution available in April 2020 could immediately scale to the extent required to combat the COVID-19 onslaught.

Over decades IMS had developed a robust **case management capability** which allowed them to repurpose existing Bluebird technology to quickly enable the NDoH to manage this epidemic down to an individual case level.

## Governance and Ownership of BlueIIS

Please see [intelms.com](http://intelms.com) for detailed information on governance. It is instructive that both the Netcare Group and the Attorney General's Office performed comprehensive audits which were both passed with flying colours - the external audit for the Netcare group gave us full marks (100% rating). The AG did not publish their score.

The BlueIIS is licensed to IMS which is, in turn, privately owned. There is a path offered to government to purchase the BlueIIS if that is deemed advantageous.

## How it Works

Distribution facilities, Vaccination facilities, Vaccinators and Vaccine Recipients are all registered on-line (although there is also a path to register recipients at the point of care). Each vaccination package and each vial is tracked using its unique bar code.

Potential recipients on registration get a unique bar code (paper and electronic), an appointment location and a time-slot (calculated from various input including patients preference). Appointment reminders are sent out by both email and SMS.

Vaccinators scan the recipient's bar code, administer the vaccine, scan the vial and release the recipient after a period of observation.

BlueIIS automates the documentation of this process.

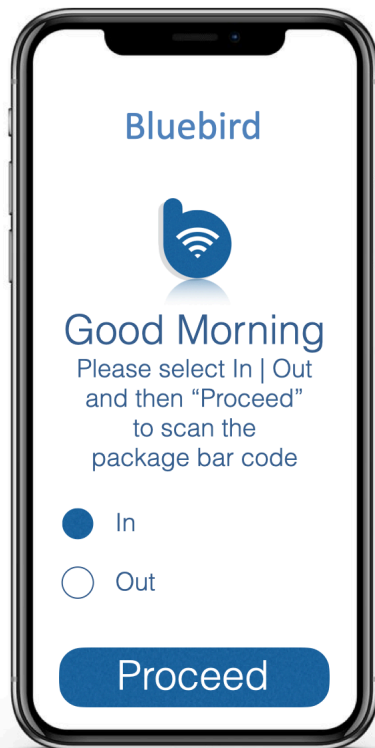
Organizations might have multiple sites (facilities involved with vaccine distribution and/or vaccination). This might include private role players such as HASA, IPAs, retail pharmacies and others.

## Distribution

BlueIIS's end-to-end verification helps build trust in the national distribution system

- All COVID-19 vaccine movement including waste and returns are monitored end to end in real-time
- Calculated inventory is compared with regular onsite stock takes (done with BlueIIS package bar code scanning)
- Inventory discrepancies are quickly identified to allow for prompt intervention and resolution
- Real-time data supports the creation of distribution performance metrics

## Bluebird Distribution Application



National Vaccine Store

Security  
Stock Control  
Real-time inventory by vaccine  
and Location  
Analytics of dispersion



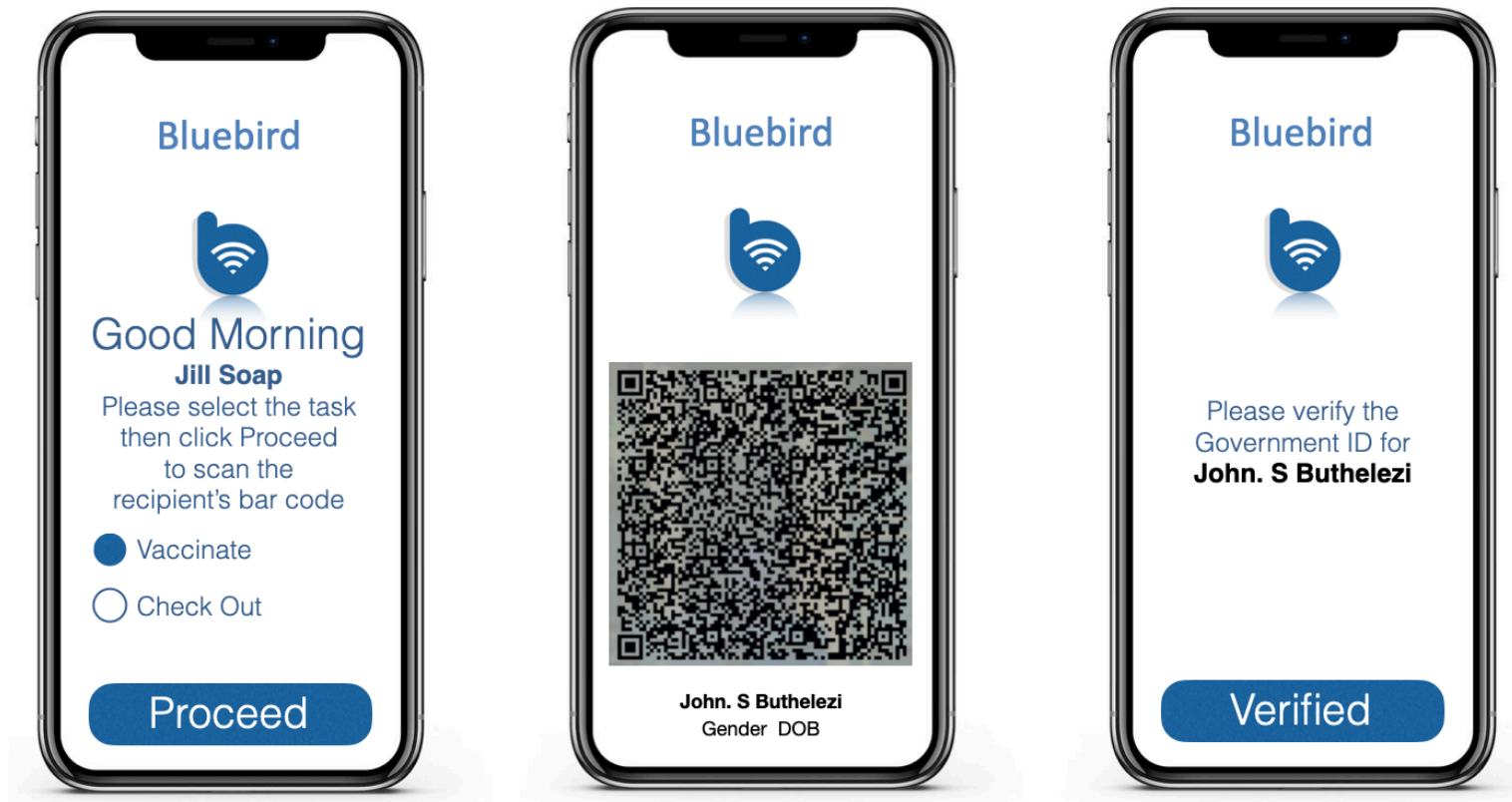
Provincial Vaccine Store



## Vaccination

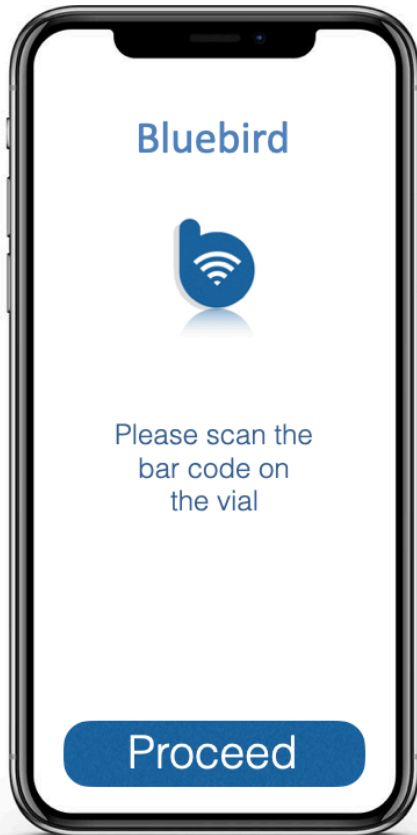
On log in, the Vaccinator can see patients scheduled, is guided through each step of the vaccination process until the vaccine recipient has left the facility. The BlueIIS mobile app. ensures automated collection of all critical data to empower management at a local and national level. Stock is replenished as vaccines are used.

## Bluebird Vaccinator Application





## Bluebird Vaccinator Application

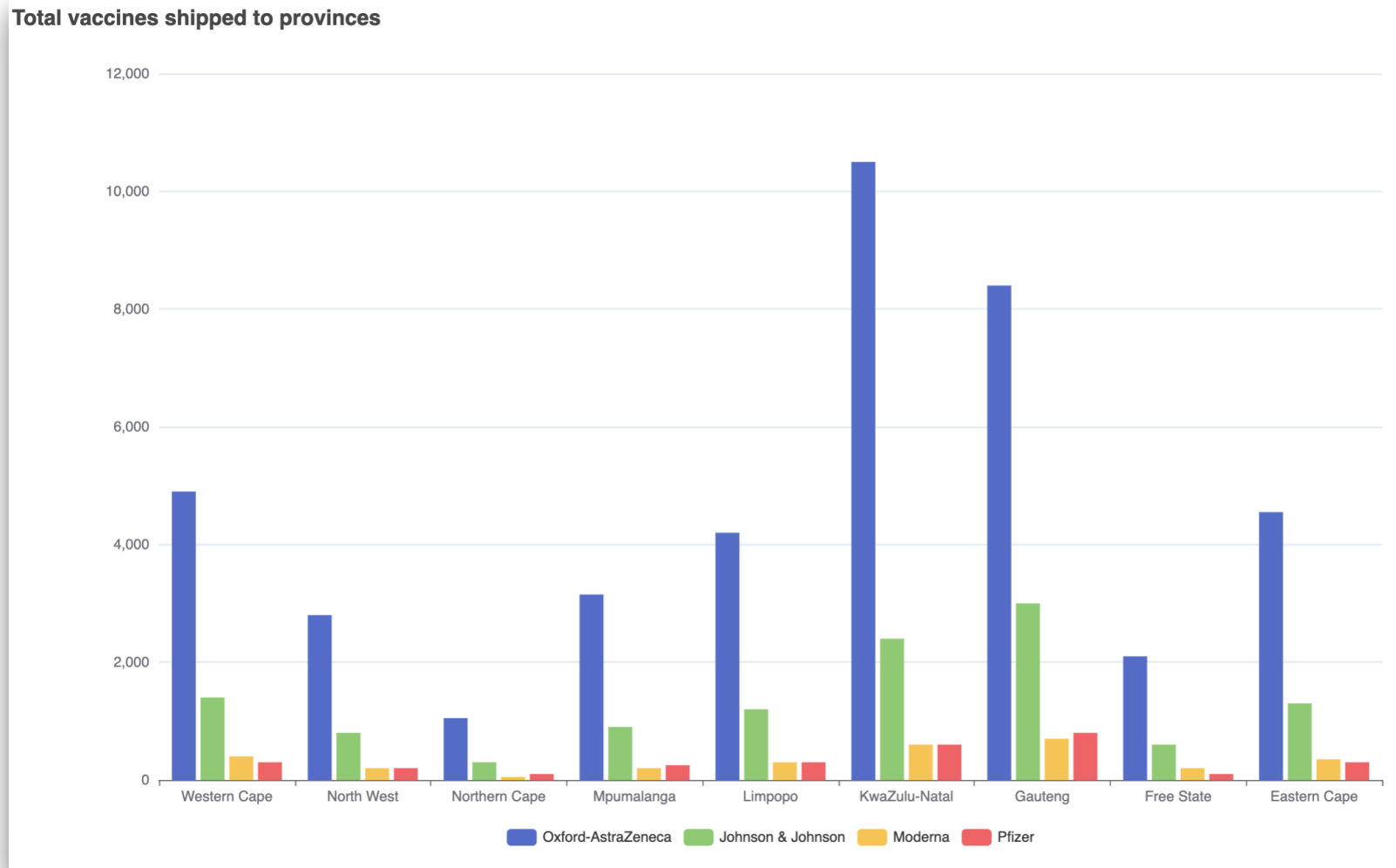


## Reporting

The BlueIIS aggregates vaccination data in order to help guide public health initiatives that improve COVID-19 vaccination rates.

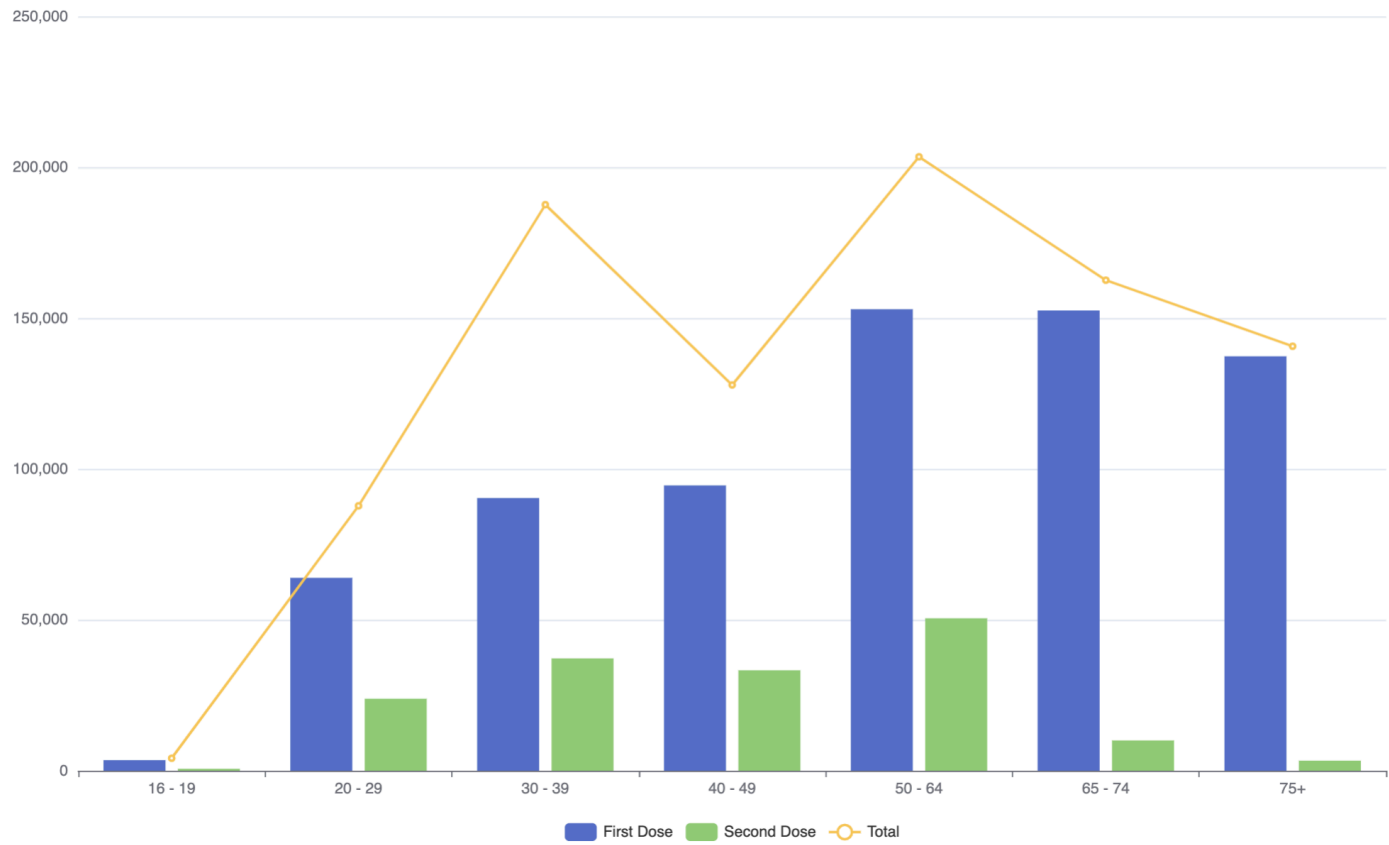
Analytic dashboards provide distribution performance metrics.

BlueIIS reports on the consequences of the inoculations, side effects, efficacy, amount of time it takes to develop antibodies etc. All stratified by population type, age, gender, pre existing conditions ... Examples:

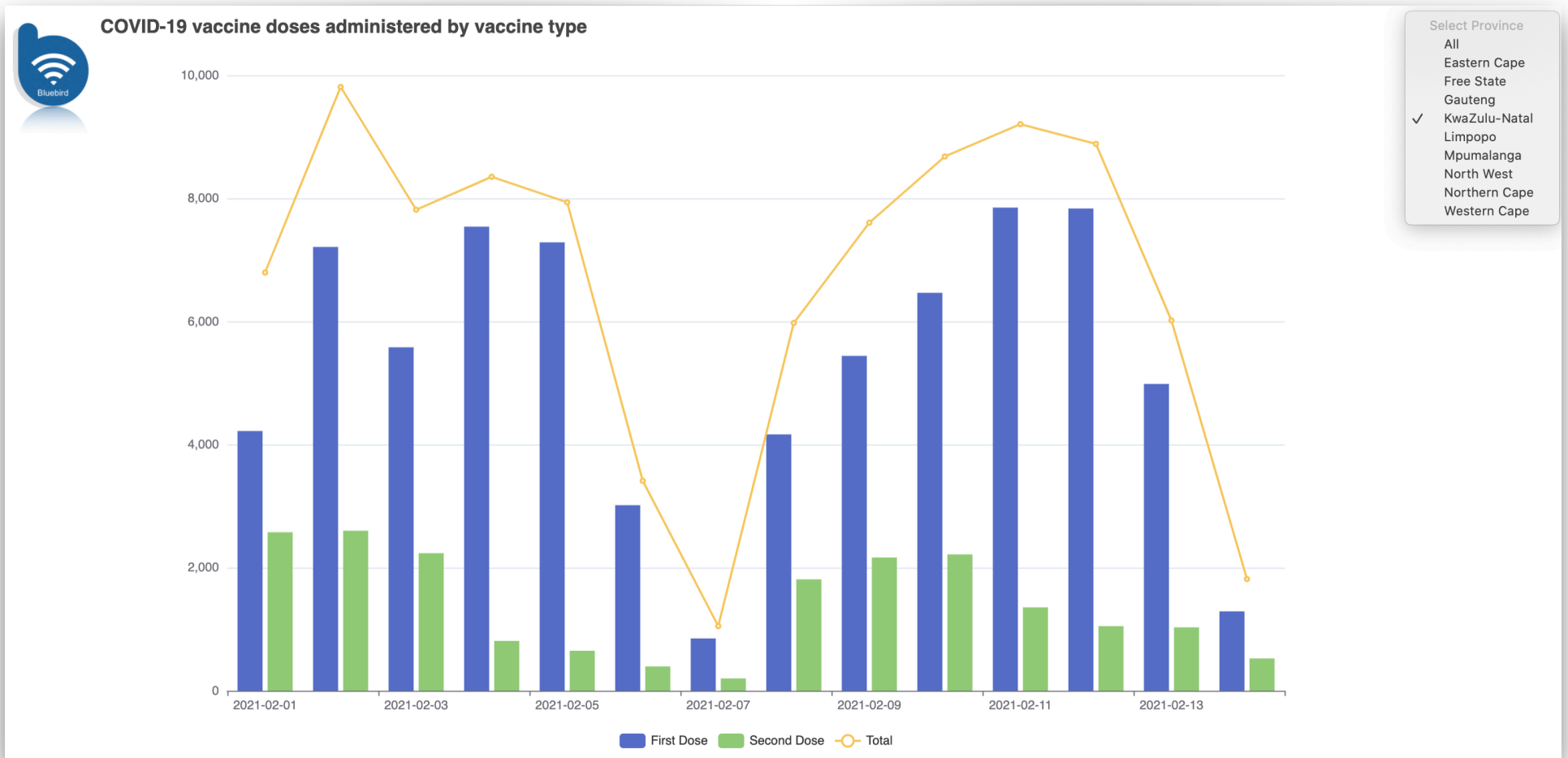




### COVID-19 vaccine doses administered by age



Bluebird can product reports broken out by Vaccination Facility as well as geographic region (right down to district and even voting ward)



## Privacy and Security

IMS understands the importance of privacy and security of confidential patient information and have built a 25-year reputation on protecting confidential patient information. Bluebird is fully compliant with current legislation.

Please see <http://www.intelms.com/1i> and [intelms.com/211](http://intelms.com/211) for more information on Bluebird's privacy and security policies.

The patient's bar code uses a Bluebird UUID. Only verified Bluebird Users (in this case Vaccinators using the Bluebird IIS Mobile App.) are able to access a single patient's data and that data is limited to this use case.

## Summary

By repurposing existing robust and well proven systems, IMS can quickly provide the South African NDoH a single *integrated* Immunization Information System to:

- Reliably distribute COVID-19 vaccines via a flexible but controlled national supply chain
- Schedule the appropriate vaccine recipients based on flexible but automated system
- Co-ordinate supply, vaccination and adverse event surveillance on a mammoth scale

BlueIIS was designed to empower national government to effectively manage the largest public health initiative in the country's history..