LUMI™
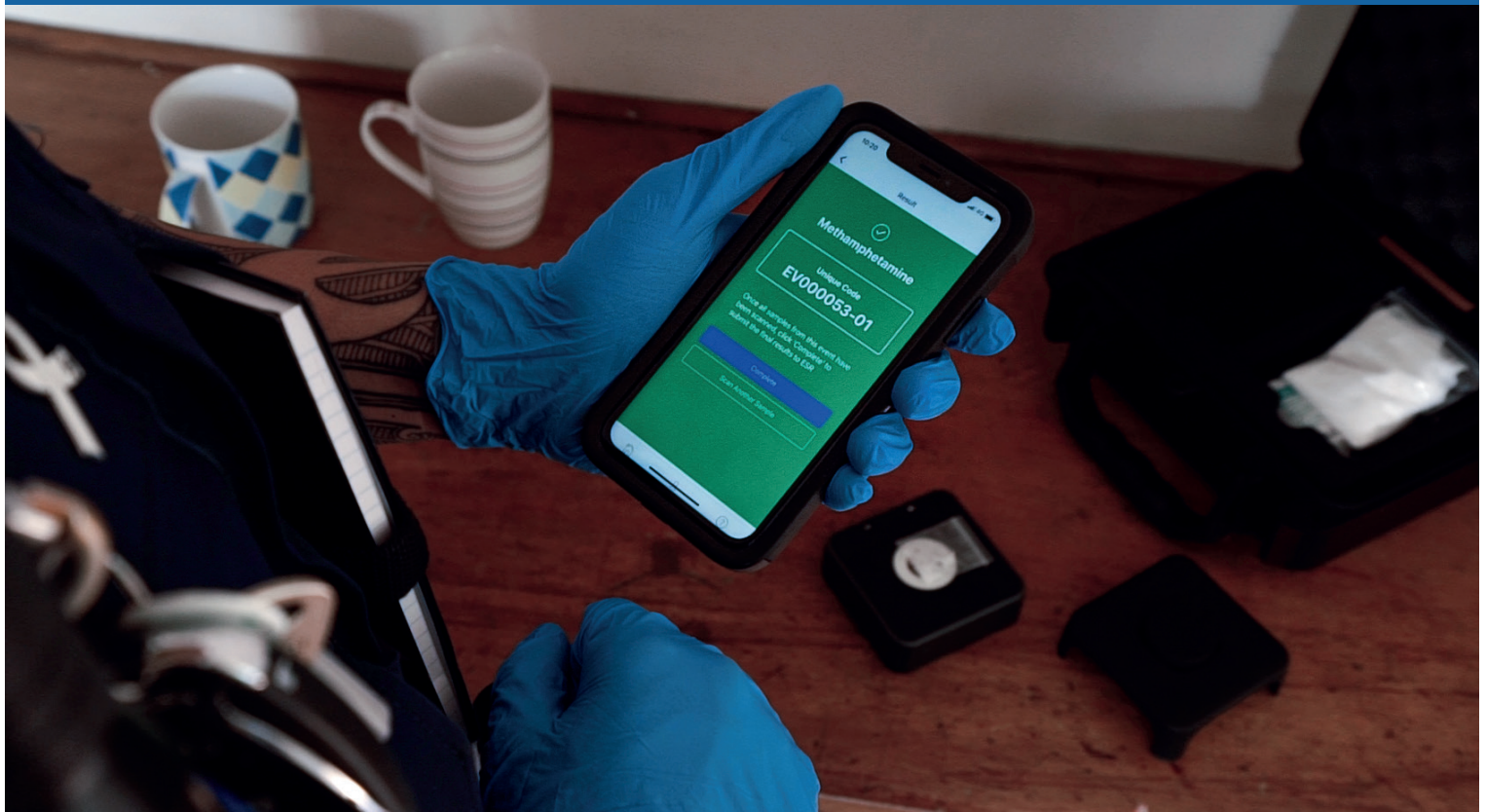
DRUG SCAN

Illicit drug screening simplified by science

Real-time drug detection and decision
making in the palm of your hand

E/S/R
Science for Communities
He Pūtaiao, He Tāngata

Lumi™ Drug Scan combines a portable handheld device, the Lumi™ Mobile App, and a secure cloud service to deliver real-time analysis of drug samples. This means rapid turnaround and unprecedented access to a virtual drug reference library built by and used in a real-world forensic laboratory.

Lumi™ can scan through clear packaging to tell if something contains methamphetamine, cocaine, or MDMA, meaning officers don't need to handle unknown substances. Lumi™ has been co-designed and validated in partnership with frontline police, resulting in a robust, reliable, and responsive system.

INTRODUCTION

The interception of suspected illicit drugs is a daily occurrence for police forces. Each time a suspected drug sample is intercepted the officer is required to make a decision about how to progress the case. This early decision-making process has previously been informed by circumstances and officer experience.

As police increasingly seek to adopt evidence informed practices, the need for science and data for early decision making is becoming more important. Real-time screening of suspected drug samples has the potential to provide valuable information to support officer decision-making, although current methods available do not address these needs: laboratory analysis is not sufficiently rapid, handheld devices were previously too expensive to make them widely accessible, and traditional chemical tests suffer from limited specificity and potentially expose the officer to health and safety risks by requiring them to handle unidentified substances.

The design-thinking methodology helped to ensure Lumi™ is an end-user-focused solution that supports officer decision making.

Lumi™ addresses these challenges, delivering real-time analysis in the palm of your hand.

HOW LUMI™ WORKS

Lumi™ Drug Scan enables officers to screen suspected drug items themselves by placing the item, within clear packaging, directly onto the device.

Lumi™ Drug Scan process
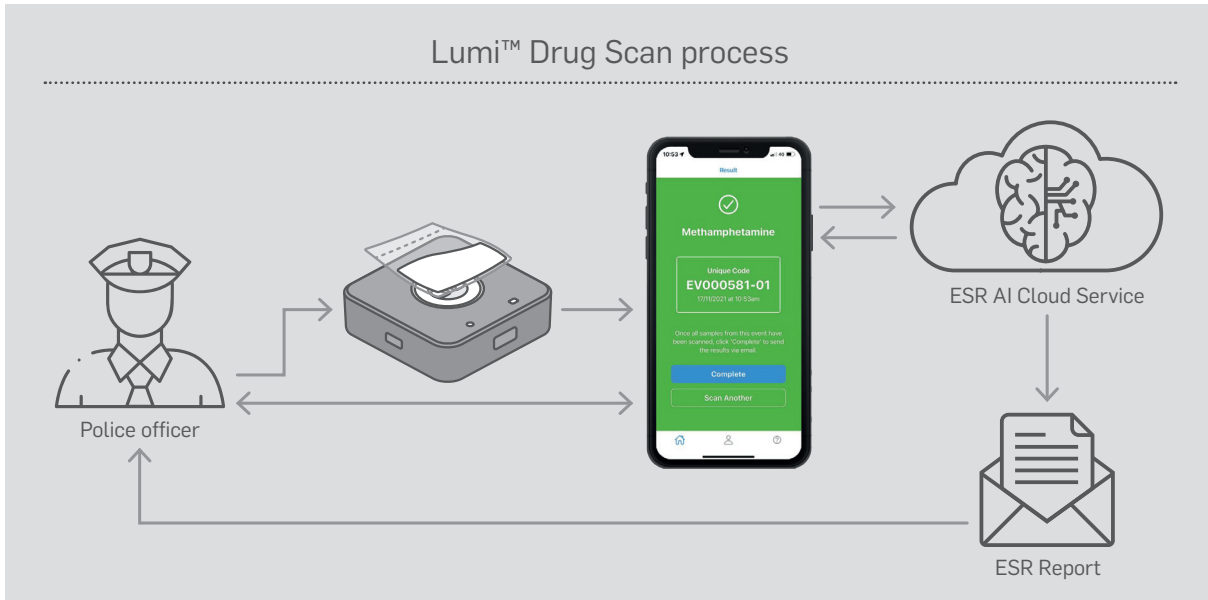
STEP 1: The officer enters relevant case data and takes a photograph of the item using the Lumi™ App.

STEP 2: The item is placed on the device, generating a spectral scan that represents the chemical composition of the substance.

STEP 3: The data is transferred to a secure cloud environment where drug detection algorithms analyse the data and determines whether drugs of interest are present.

STEP 4: A notification is returned almost instantly to the officer's phone informing them of the result.

STEP 5: A report summarising details of the item and result are also automatically generated and emailed to the officer. This report can be attached to case records and used to make decisions about how to proceed.
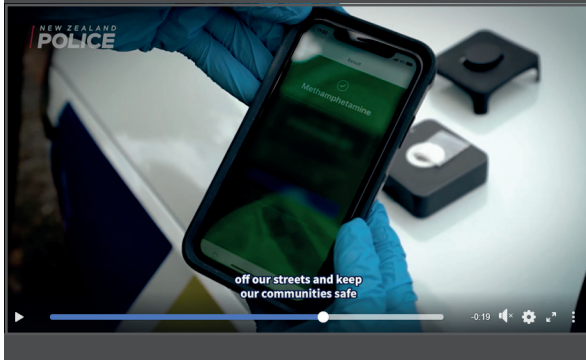
COLLABORATIVE DEVELOPMENT

The collaborative approach between New Zealand Police and ESR enabled new technology and data science techniques to be combined to develop a novel solution for the detection of illicit drug samples. The design-thinking methodology employed throughout the project ensures that the outcome delivers an end-user-focused solution that supports officer decision making.
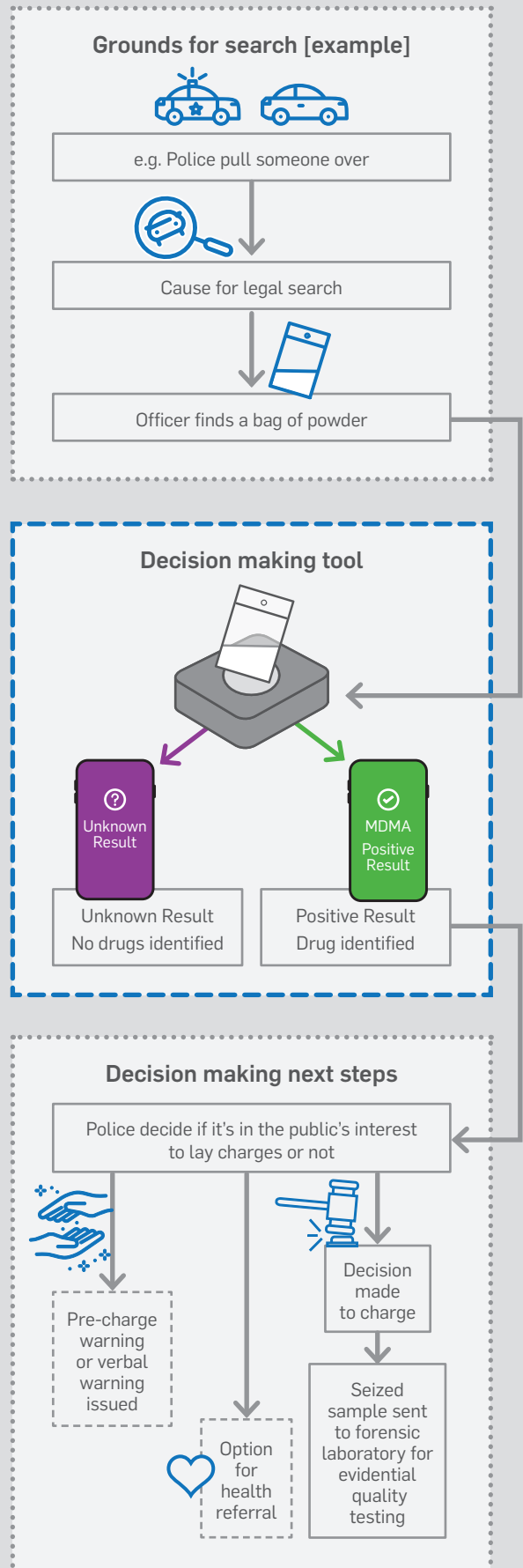
LUMI™ DRUG SCAN TRIAL VIDEO

Watch this video to find out more about the Lumi™ Drug Scan service:
www.facebook.comwatch/?v=419053045681655

LUMI™ ADDS SCIENCE TO SUPPORT INFORMED DECISIONS

Grounds for search [example]

e.g. Police pull someone over

↓

Cause for legal search

↓

Officer finds a bag of powder

Decision making tool

Unknown Result

Unknown Result
No drugs identified

MDMA Positive Result

Positive Result
Drug identified

Decision making next steps

Police decide if it's in the public's interest to lay charges or not

Pre-charge warning or verbal warning issued

Option for health referral

Decision made to charge

Seized sample sent to forensic laboratory for evidential quality testing

········· Business as usual   ─ ─ ─ Lumi™ Drug Scan

LUMI™ DASHBOARD

The Lumi™ Analytics Dashboard provides unparalleled insights to team leaders or managers about drug use in the community in near real-time. Like the App, it's quick and simple to use.
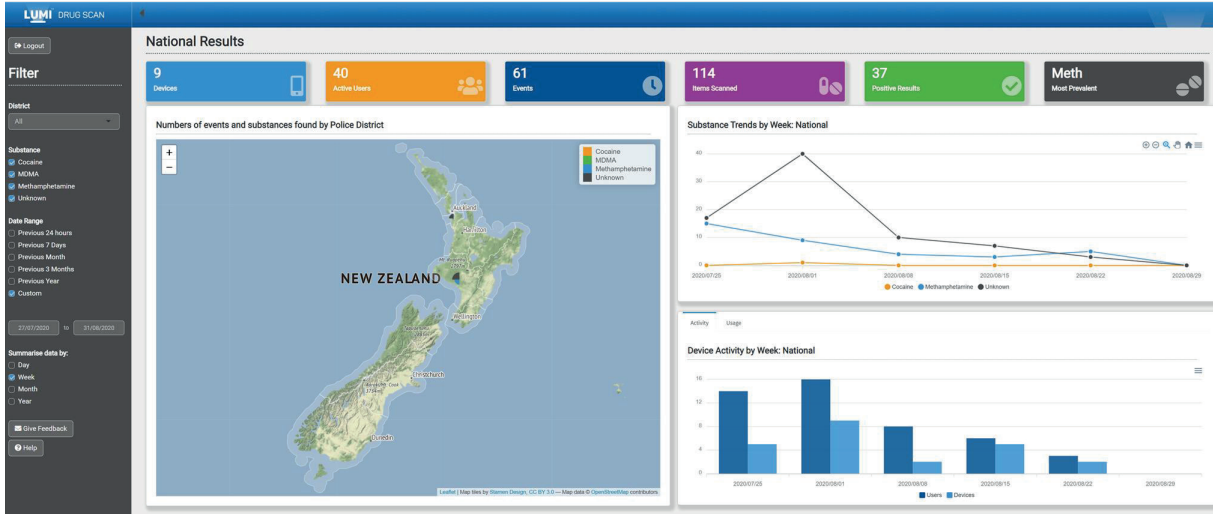
Lumi™ is underpinned by a sophisticated platform that draws upon ESR's forensic drug library built-up over decades to give highly accurate results.
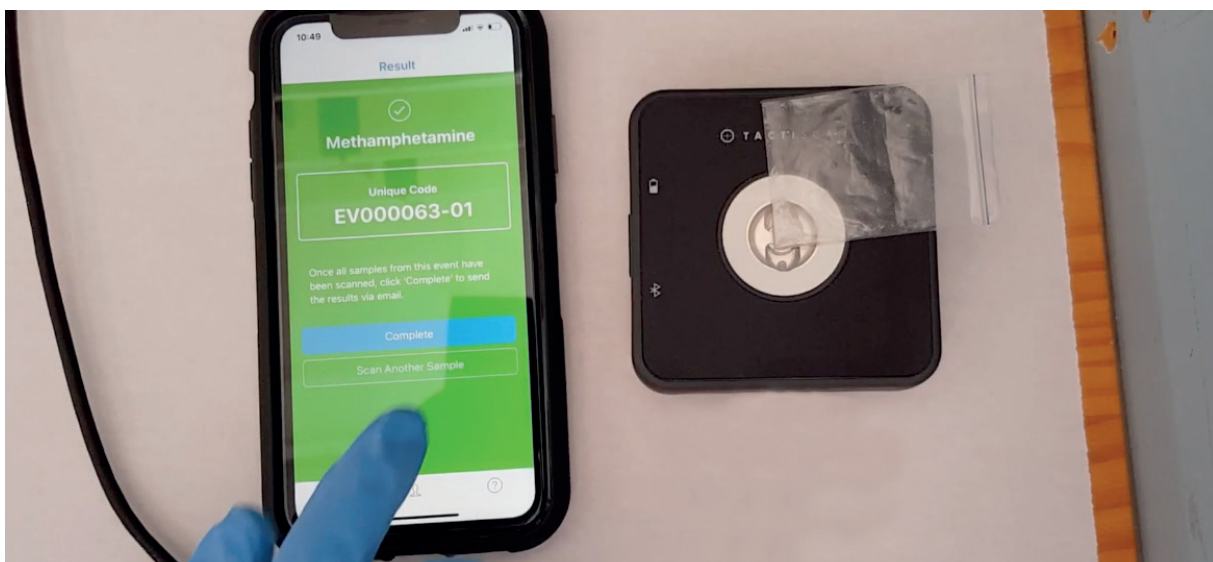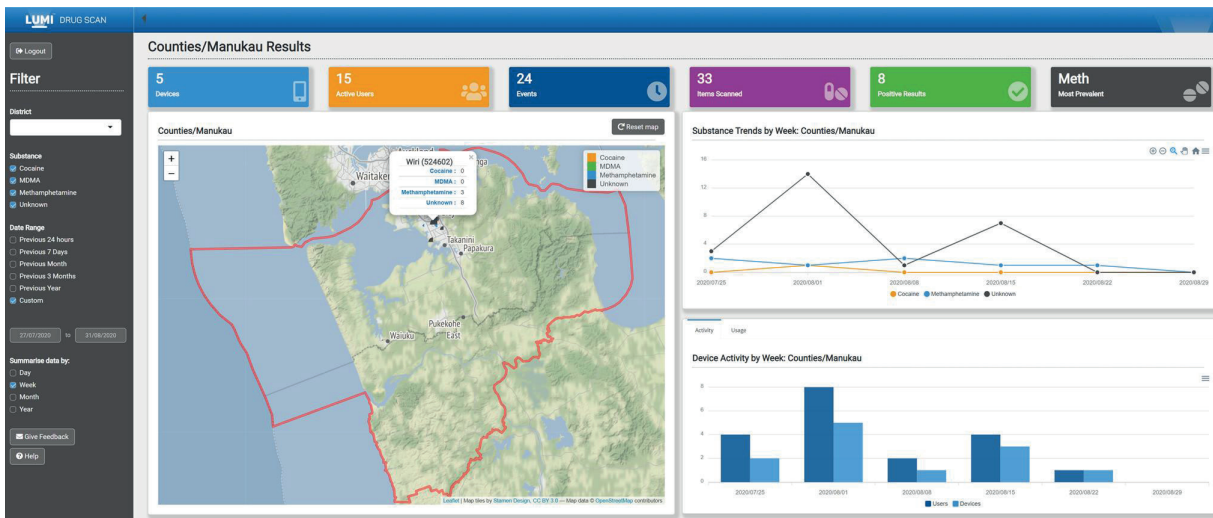
LUMI™ MACHINE LEARNING DRUG DETECTION

Algorithms are trained to 'recognise' the features in drugs that are of interest by using a range of samples (in terms of colour, particle size, purity) for each drug type.

A detailed forensic validation was undertaken on the drug detection machine learning models providing confidence on the reliability and performance on real world samples.

Currently Lumi™ can detect the presence of methamphetamine, cocaine, and MDMA (ecstasy) within tablet, crystal or powder samples.

The Lumi™ machine learning models have been built from over 500,00 scans from illicit drug samples. This enables the drugs of interest to be reliably detected in a range of street samples of different composition and purity.

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ESR (THE INSTITUTE OF ENVIRONMENTAL SCIENCE AND RESEARCH LIMITED)

ESR is New Zealand's Crown research institute specialising in science for communities. ESR uses world-leading science to safeguard our health, keep our communities safer, protect our food-based economy, and improve the health of our water and natural environment.

From the organisation that brought you STRmix™ – empowering forensic science