COVID-19 and Applications of Digital Public Health

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General Director
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Estonian journey since 27.02.2020

May 1st 2020

7 days mortality

7 days new posit. cases
Key element – Communication Synergy

GOV + MOSA + NHB + ITA = JOINT COMM FORCE
CORONAVIRUS TESTING

This website contains all the information about getting tested based on a coronavirus referral letter, cross-border testing and paid testing options as well as information about the virus, testing methods and a lot more. If you have a referral letter, you can book an appointment to give a sample HERE.

Stay negative!

For Patients

For Doctors

For Organisations

News

Testing sites

Mobile apps
A solution for COVID-19 laboratory test results

COVID-19 test data is automatically sent from national laboratories to HIS.

Data validation rules assure that the number of possible errors is minimized.

**Process**
- The laboratories analyzers record the digital results of the analysis in the laboratory information system.
- Laboratories confirm the results and the result is sent to HIS in real-time.

Patients can immediately get the COVID-19 test results from the national patient portal.
Family doctors COVID-19 patients query

A service developed for family doctors for obtaining information about Covid-19 patients, in order to support them in their recovery.

Process
- Family doctors can query the list of their patients by entering a time period about which they wish to get the results
- HIS returns information about the patients who have COVID-19 analysis results

Family doctors are aware of which of their patients are sick and need additional support in recovery.
Med-SITREP
Solution for the transmission of COVID-19 patients and hospital resources data

A web application where data can be entered by authorized personnel in hospitals.

**Hospitals provide information about**
- COVID patients on ventilation, Level III intensive care patients and discharged patients
- Resource information about available and occupied hospital beds in COVID departments

The data is uploaded to data warehouse and displayed to the Health Board as a crisis management input and is published as open data.
Contact tracing e-solutions child desease period

Commercial solution – IBMi2 (end phase 1)

Domestic solution – local enterprise/under development
Quick links orchestration: external helpline+Social media

State helpline 1247

1. State helpline 1247
2. Why was the State helpline set up?

State helpline 1247

The state helpline is an information number open in Russian and English 24 hours a day in situations...
ROBOT FOR CALLS

Knows three languages, makes contact with those who have been in close contact with confirmed COVID-19 cases, gives important advice on how to proceed as a close contact.

- All over Estonia thousands of people are being monitored by the Health Board, but unfortunately the numbers are growing every day. Primary contact with the possible COVID-19 close contacts is the most important one, but The Health Board is lacking the human resources for this.

- In order to simplify the workload of “corona detectives” and reduce the time spent on phone calls, we have created a speech robot that shares notifications in three different languages to possible close contacts.

The first version of a working robot was completed in one day.

It would take an average of 30 hours to make all the phone calls by the Health Board. For comparison, it only takes a few minutes for the robot to make the calls.
Estonian corona app was created in collaboration between the private and public sector and implemented in the government cloud.

We used GAEN (Google/Apple Exposure Notification) as the main technology and implemented the DP-T3 back-end solution for the app.

The infection confirmation is based on the HIS data. Phones communicate with each other using Bluetooth signals and exchange anonymous codes that can't be traced back to the app user.

Special attention has been paid to the security of the application and the privacy of the users. The government, developers or even the phones manufacturers can't trace the information about who was in close contact with whom.

The applications source code is available for everyone in Estonian e-government code repository.
Estonian Society of Family Doctor’s initiative – Isolation Calculator

https://isolatsioonikalkulaator.netlify.app/

Millal oli sümptomaatilise SARS-CoV2 patsiendi esimene sümptomite tekkimise kuupäev?

Vali kuupäev: 22.04.2021

Viimane isolatsioonipäev (kaasa arvatud):

02.05.2021

* Isolatsiooni võib lõpetada ainult siis, kui lisaks ajaliste üritustele on viimasest palvikust on mõõdetud 72 tundi ja ägedad sümptomid on taandumud. Isolatsiooni lõpetab arst. Kordustesti paranemise kinnitamiseks ei teostata ühelgi juhul.
Open Data
Allows forecast, calculations and solutions

- We always publish up-to-date and automatically updated information once per day.
- In the field of health, open data has never been published in Estonia before.

Data is used by:
- crisis management teams
- public sector
- private sector,
- research institutions

Access to the data is an opportunity to make the necessary forecasts, calculations or create new solutions.

https://opendata.digilugu.ee
Morning state of play – COVID dashboard

Koroonaviiruse andmetest seisuga 21.04.2021 07:00:00

- Esamoodi positiivsete testede arv: 118 789 (+ 472)
- Negatiivsete testede arv: 1 125 353 (+ 3 783)
- Testide kogum: 1 244 142 (+ 4 255)
- Manustatud doodi arv: 380 503 (+ 4 233)

Viimase 14 päeva haigestumus 100 tuhande elaniku kohta (maakonnit)

Viimase 14 päeva testide arv

Viimase 14 päeva haigestumus 100 tuhande elaniku kohta kogu Eesti

Viimase 14 päeva testide jaotus, lõikes kolku

Viimase 14 päeva testide jaotus ja tulemus, lõikes kolku

Testide jaotumine

Positiivsetest testist:
Evening state of play – Vaccination dashboard
Anonymous GSM’s are divided into 3 groups:

- Fully fixed mobile phones - remains in your area at all times during the day.
- Infrequent or 95% fixed mobiles - during the day, remains in its area 95% of the time.
- Mobile phones - a mobile number is at least 5% of the day, ie 72 minutes a day, away from your area.

R dynamics in correlation to credit card use

https://liikumisanalyys.stat.ee/
Future estimation support via TOP analysts/scientists

Daily C-19 pos. rate estimate via R scenarios

Detecting coronavirus in waste water

1. Regular baseline monitoring
   County centres and towns with more than 10,000 inhabitants

2. Risk monitoring
   - Samples from international connection points (e.g., airport, port, bus stations, border crossing points)
   - Local sites (e.g., care homes, hospitals, schools, residences)

3. Precise monitoring of positive signal
   Analyses of samples from sampling shafts upstream to detect the focus of the outbreak

Interactive map of waste water surveillance results:
Electronic data exchange with the police helping with the self-isolation inspections

The solution allowed police departments to have real-time information about patients who had tested positive for COVID-19 and had to stay at self-isolation.
The Health Board’s self-service portal

Passenger locator forms can be submitted via the Health Board’s self-service environment.

Properly provided information will immediately allow us to notify passengers about the risk of infection and how to implement measures which help stop the spread of COVID-19.

The passenger locator form must be filled in before the arrival to Estonia.
Health Information System – Vaccination Certificate

Identity check
**QR code – Verification of Vaccination Certificate**

Immuniseerimise tõendi pdf

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- Document/Signature hash
- Signature consistency
- Signature is trusted in blockchain
- Health authority authenticity
- Person Identifiers Verified

**Vaccination Certificate**

- Disease or Agent Targeted: COVID-19
- VACCINE/PRODUCT: covid-19 vaccine
- VACCINE MANUFACTURER: Comirnéty
- NUMBER IN A SERIES OF VACCINATIONS: 2 out of 2 doses
- VACCINATION STATUS: Completed
- DATE OF VACCINATION: 2021-03-04
- DATE OF BIRTH: 1990-12-11
- PERSON IDENTIFIER: 39012110092
- PERSON NAME: Mr. Gustav Johannes
- PERSON DATE OF BIRTH: 1990-12-11
- PERSON IDENTIFIER: SSRNOOD TWP.

**Estonian Health Information System**

Health and Welfare Information Systems Centre

- Contact: +372 7943 943 |
  ab@tehik.ee

**Estonian Health Information System**

Service information

- Contact: +372 7943 943 | ab@tehik.ee
Thank You!

https://www.terviseamet.ee/en