

M

**MUNI
MED**

Data-driven decision making in practice: Experiences in academia and government

Martin Komenda

Information and Digital Technologies 2023, Zilina, Slovakia

⑤ Motivace zmlouva
→ poukázat na reálnou potřebu

→ představit reálné případové studie

→ najít podobné (stejně) potřeby na MU

⇒ **Spolupráce, efektivita, rychlost**

→ uvolnit distanci = zájem = spolupráci

⑥ Praktická část (po předstávkě)

Jak pracujeme s daty na LF MU, IIVT, v městě Brně

Přístup na LF MU

- SIMU s technologií a moderními nástroji mobility v praxi
- Efektivní propojená spolupráce

① Zpracování (Jde)
→ Motivace = pohnutí vědomí
fyz. procesy
→ Spolupráce s odborníky
→ dostupnost dat = jsou MU
mim. nástroj
včetně
simulace dat
Principy efektivní
s daty informacemi?
přístupní

MUNI MED

Martin Komenda

<https://webstudio.team/>



ÚZIS Ústav zdravotnických informací a statistiky ČR
Institute of Health Information and Statistics of the Czech Republic

COVID-19 O NÁS NZIS KONFERENCE KOMUNIKACE S ÚZIS AKT

Sbíráme a zpracováváme statistická data
pro zkvalitnění našeho zdravotnictví



3. 8. 2021
Přibližné výsledky statistických šetření o plnění
místních v resortu zdravotnictví za období 21.
července 2021

30. 8. 2021
Hospitalizování v nemocnicích ČR 2019

27. 8. 2021
Zdravotnictví ČR: Personální kapacity a odn
2019

16. 8. 2021
Vzácná onemocnění mládeže český

21. 7. 2021
Linka 1221 – pomoc s očkováním, certifikáty
evidování náležitosti

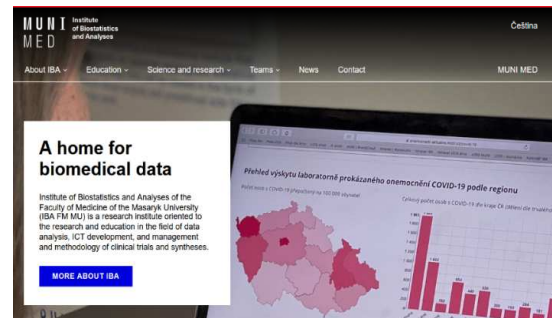
30. 6. 2021
COVID-19 byl vloni druhou nejčastější příčin

Nabídka zaměstnání na ÚZIS ČR

Znovisek...

MUNI MED

Institute
of Biostatistics
and Analyses



Points of interest

•Web design

•Graphic design

•Logos, corporate identity

•Implementation of MUNI visual style

•Static web presentations

•Comprehensive web applications and portals

•Open data

•Interactive data visualisations

•Copywriting

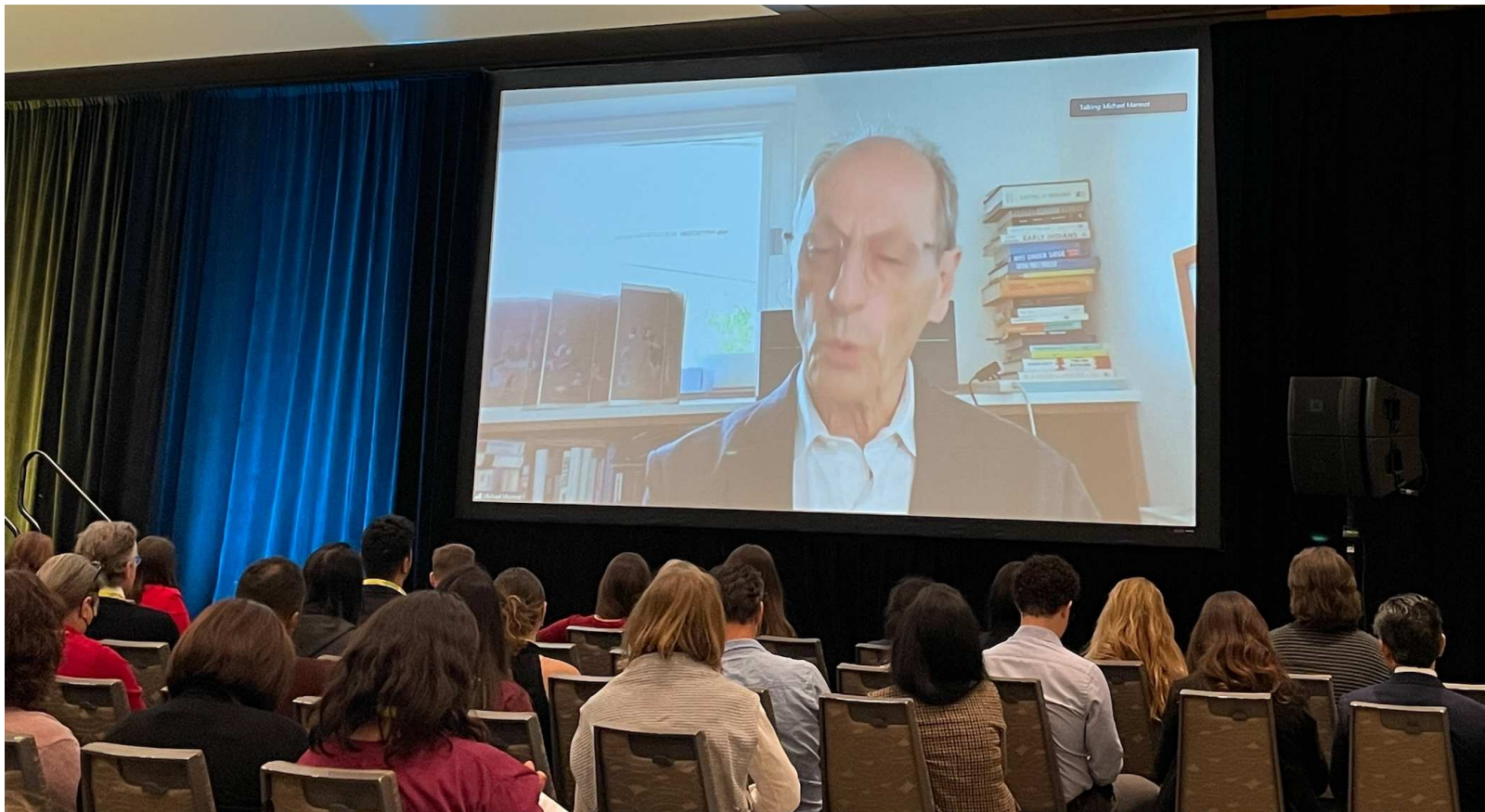
•Language services

•Data processing

•Project management

„No data, no evidence“ (Michael Marmot)

GIN 2022 Conference, Toronto (Canada)



Relevant topics

open data

guidelines

health
literacy

easy-to-read

valid information

infographics

general public

health
literacy

patients

M U N I
M E D

Three main pillars

Information & (open) data



Information, data & health literacy



Decision making support

Motivation

Why?

Rationalisation

Objectivity

Guarantee

Interdisciplinarity



Data-driven decision-making

Target groups

For whom?



Data novice

📱 20 % laptop / 80 % mobile

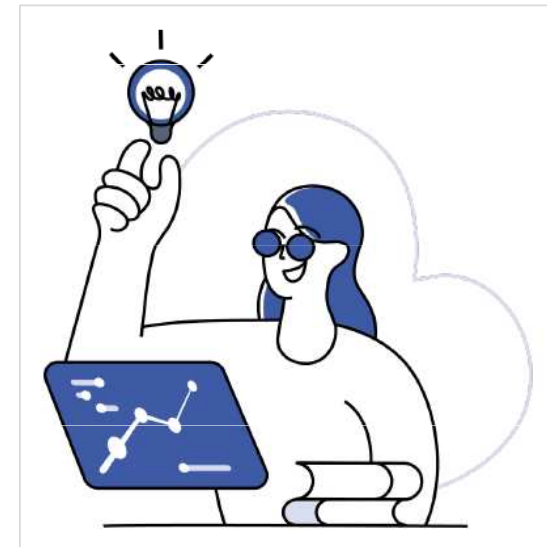
👤 The general public



Data explorer

📱 50 % laptop / 50 % mobile

👤 Informed / professional public:
governor, mayor, doctor, hygienist,
journalist



Data expert

📱 80 % laptop / 20 % mobile

👤 Data expert / scientist:
data analyst, data journalist,
public and state administration,
scientist, researcher, etc.

Data novice



Data novice

📱 20 % laptop / 80 % mobile

👤 The general public

📄 Information and data literacy



The user has basic knowledge of using information technologies. Can recognize, collect and share information in a digital environment. Understands the basic principles of assessing the credibility of sources. He knows the basic concepts of data analytics. He occasionally searches for information in areas of his own interest.

🕒 Ability to formulate information needs, locate and retrieve digital data, information and content, assess the relevance of the resource and its content, store, manage and organize data, information and content in the digital environment.

🚶 Goals and motivation

- He searches for information and data from the health sector on an ad hoc basis.
- He is more interested in the results than the journey.
- Articles and data overviews are accessed primarily via a search engine or via social networks.
- Charts and articles are shared via URL, in image form, video, or as PDF exports.
- To fulfill the need for information, it looks for mostly unstructured data.
- He approaches information more emotionally.

📄 Communication form

DATA NOVICE

- Infographics** → web, Power BI, Infogram
- Diagrams and illustrations**
- Video** → web, social networks
- Articles** → web
- Newsletter** → html
- Social networks** → Instagram, Facebook, YouTube, Twitter, LinkedIn
- Audio / video podcast** → YouTube, Spotify, iTunes, etc.
- Interactive education** → web

DATA EXPLORER

- Interactive visualization (dashboard)** → Power BI, Looker, etc.
- Data summaries** → email
- Webinars** → Teams, Zoom, YouTube
- Open data set** → open data catalog
- Analytical studies**
- Yearbooks and publications** → book, ebook, website
- Conferences / workshops**

DATA EXPERT

- Data with controlled access** → Saferoom, API, shared storage

Data explorer



Data explorer

50 % laptop / 50 % mobile

Informed / professional public:
governor, mayor, doctor, hygienist,
journalist

Information and data literacy



The user has more advanced knowledge in the use of information technologies. He is able to work with data, analyze it and draw conclusions from it. Understands the basic principles of data processing, such as collecting, organizing, analyzing and visualizing data. Has a basic understanding of data analysis tools and understands the importance of critical thinking when interpreting results.

Ability to formulate information needs, locate and retrieve digital data, information and content, assess the relevance of the resource and its content, store, manage and organize data, information and content in the digital environment.

Goals and motivation

- He often searches for information and data from the health sector for his work.
- Articles and data reports are accessed directly.
- Knows the basic sources of data reports and recognizes their relevance.
- He approaches information critically and can draw conclusions from it and interpret it.
- It looks for mostly secondary sources of data.
- He wants to have all reports at hand as quickly as possible.
- It searches for structured and unstructured data to fulfill its information needs.
- He is intrinsically and explicitly motivated to education in data issues.

Communication form

DATA NOVICE

- Infographics** → web, Power BI, Infogram **Diagrams and illustrations**
- Video** → web, social networks **Articles** → web **Newsletter** → html
- Social networks** → Instagram, Facebook, YouTube, Twitter, LinkedIn
- Audio / video podcast** → YouTube, Spotify, iTunes, etc.
- Interactive education** → web

DATA EXPLORER

- Interactive visualization (dashboard)** → Power BI, Looker, etc.
- Data summaries** → email **Webinars** → Teams, Zoom, YouTube
- Open data set** → open data catalog **Analytical studies**
- Yearbooks and publications** → book, ebook, website
- Conferences / workshops**

DATA EXPERT

- Data with controlled access** → Saferoom, API, shared storage

Data expert



Data expert

80 % laptop / 20 % mobile

Data expert / scientist:
data analyst, data journalist,
public and state administration,
scientist, researcher, etc.

Information and data literacy



The user has more advanced or expert knowledge in the use of information technologies. He is an expert in the field of information and data literacy. He is able to evaluate sources, process and analyze data, recognize sophisticated forms of introduction and disinformation. He has a deep understanding of data rights, ethical aspects of data processing and is able to comprehensively and critically evaluate information in the digital world.

Ability to formulate information needs, locate and retrieve digital data, information and content, assess the relevance of the resource and its content, store, manage and organize data, information and content in the digital environment.

Goals and motivation

- He searches for information and data from the health sector every day for his work.
- The data is accessed directly.
- Knows most sources of data reports and recognizes their relevance.
- He approaches information critically and is able to evaluate, process, analyze, identify trends and subsequently interpret them.
- It looks for mostly primary data sources.
- He wants all reports to be complete and easily navigated (filtering).
- To fulfill the need for information, it mostly searches for structured data.
- It needs as much input data as possible to work with data.

Communication form

DATA NOVICE

- Infographics** → web, Power BI, Infogram
- Diagrams and illustrations**
- Video** → web, social networks
- Articles** → web
- Newsletter** → html
- Social networks** → Instagram, Facebook, YouTube, Twitter, LinkedIn
- Audio / video podcast** → YouTube, Spotify, iTunes, etc.
- Interactive education** → web

DATA EXPLORER

- Interactive visualization (dashboard)** → Power BI, Looker, etc.
- Data summaries** → email
- Webinars** → Teams, Zoom, YouTube
- Open data set** → open data catalog
- Analytical studies**
- Yearbooks and publications** → book, ebook, website
- Conferences / workshops**

DATA EXPERT

- Data with controlled access** → Saferoom, API, shared storage

Target groups

For whom?



★☆☆ Information and data literacy

Data novice

THE GENERAL PUBLIC



★★☆ Information and data literacy

Data explorer

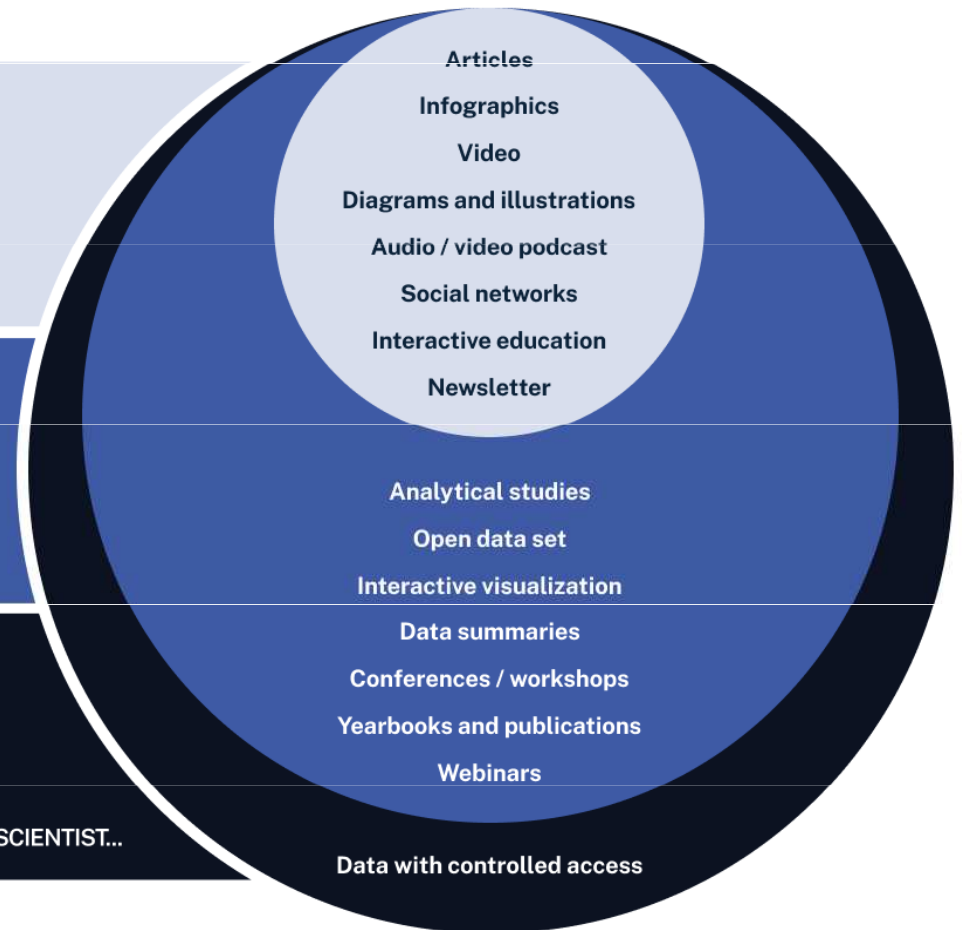
GOVERNOR, MAYOR, DOCTOR, HYGIENIST, JOURNALIST...



★★★ Information and data literacy

Data expert

DATA ANALYST, DATA JOURNALIST, PUBLIC AND STATE ADMINISTRATION, SCIENTIST...



Target groups

For whom?



★★★ Information and data literacy

Data novice

THE GENERAL PUBLIC

Fragile
Low dissemination rate
Risk of unintentional misinterpretation



★★★ Information and data literacy

Data explorer

GOVERNOR, MAYOR, DOCTOR, HYGIENIST, JOURNALIST...

Influenceable
High dissemination rate
Risk of intentional misinterpretation



★★★ Information and data literacy

Data expert

DATA ANALYST, DATA JOURNALIST, PUBLIC AND STATE ADMINISTRATION, SCIENTIST...

Resistant and stable
Medium dissemination rate
Low risk of misinterpretation
High level of distrust

Basic requirements for outputs

Clarity

User-friendliness

Repeatability

Time efficiency

Availability

Generalisation

Automation

...

We are not lagging behind...

Open science

Open data

FAIR data

Business intelligence

Artificial intelligence

IT, health and data
literacy

... but we still need

- experience of specialists (experts)
- inter-team (interdisciplinary) collaboration
- leadership support
- respect for basic ethics and licensing rules

Contents

What?

Diverse output formats

Appropriate
interpretation

Basis for decision
making

Data processing

How?

Methodology

Technology

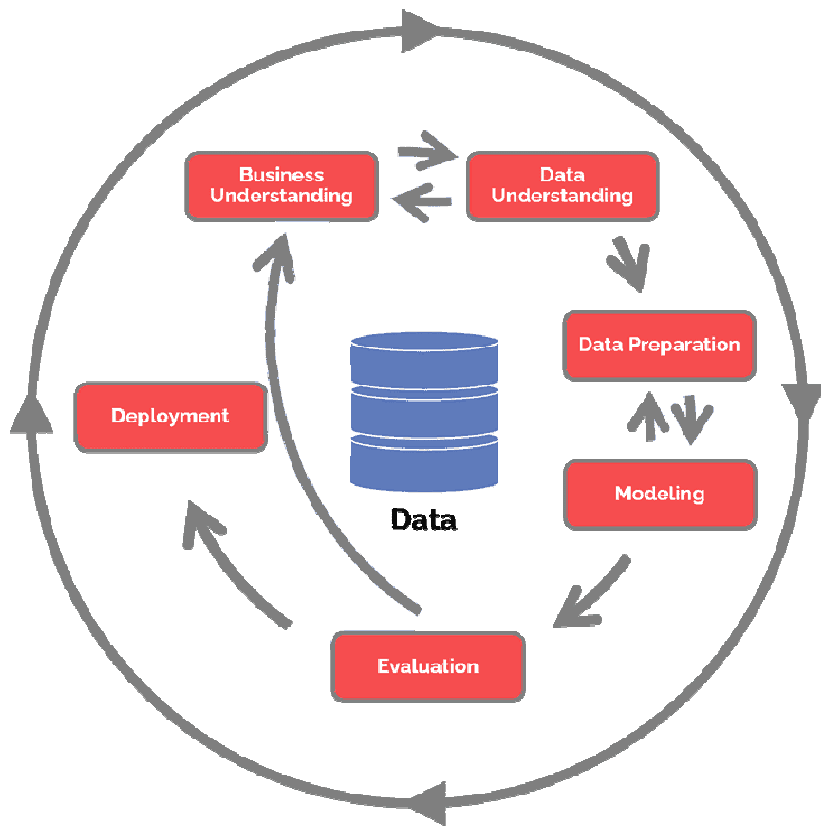
Specialists
and experts

Available data

Quality

Methodological background

Cross-industry standard process for data mining



Source: <https://www.datascience-pm.com/crisp-dm-2/>

Information systems and agendas at MUNI

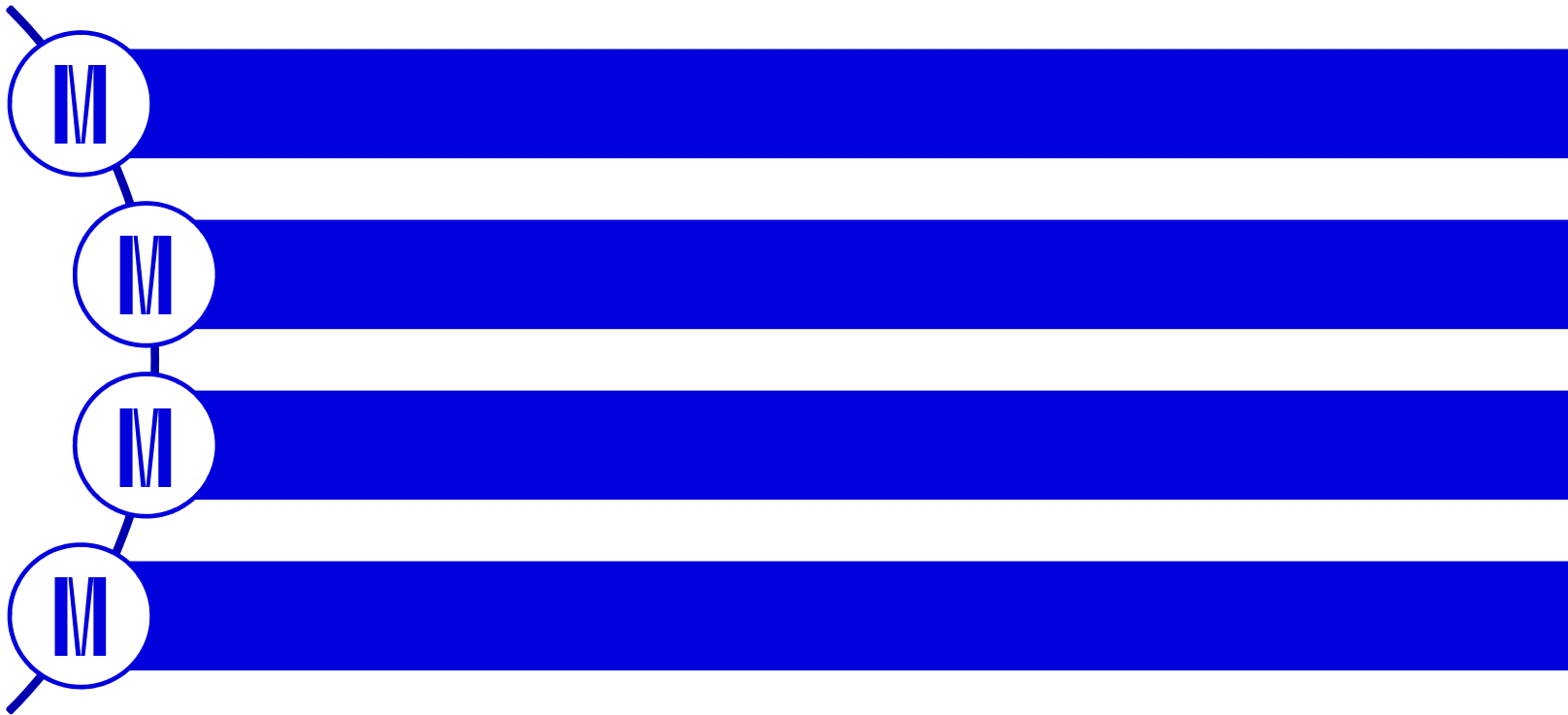
Agenda	System (module name)
HR	Magion (PaMS), INET (HR)
Economics	Magion (EIS), INET (Economics), IS (Business Centre), MUNIshop
Study	IS
Research	INET (Research), IS (Publications and Reporting for RIV), IS CEITEC, LMS
File Service	IS (Office)
Public Procurement	E-ZAK, INET (DNS, framework contracts and central purchasing)
Libraries	MU Library Catalogue (library system), EIZ (electronic information resources)
Asset Management	Magion, INET (economics – property), BMS (building management), Kompas (passports)
Operations	INET (Operations)
Accommodation	ISKaM (dormitory accommodation), Housing (private accommodation)
Catering	Kredit (catering in canteens)

**M U N I
M E D**

Are we working efficiently with data from various information systems?

And again, the motivation

Why?



We are learning from the greats



Without data, you're
just another person
with an opinion

- W. Edwards Deming

MUNI
MED

Selected case studies

Medical and healthcare education

M

SIMUportfolio

Integration platform at MED MUNI

MUNI
MED

Simulační centrum LF MU Publikace Kontakty English Přihlásit se

SIMUportfolio

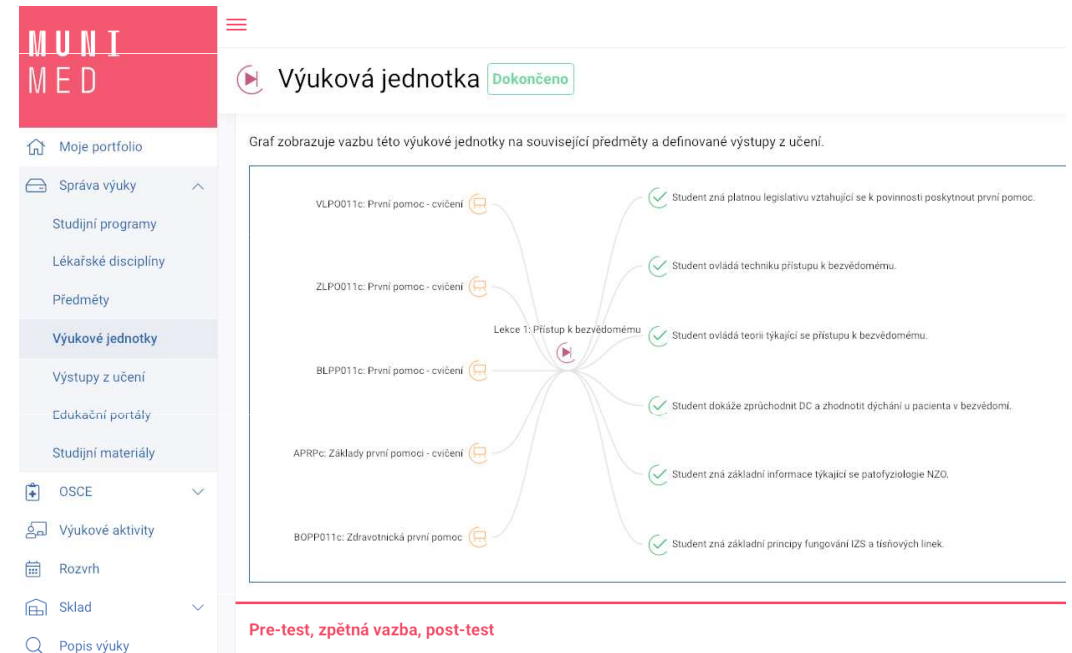
Reprezentuje vytvoření inovovaného, propracovaného a dynamického systému, který usnadňuje studentům i vyučujícím orientaci ve výuce a ve svém důsledku zefektivňuje znalosti a dovednosti studentů pro praxi.

Přihlásit se

OSCE zkoušky Virtuální scénáře Prohlížeč kurikula Multimédia ve výuce Studijní materiály

Content management

- For parametric description of curriculum
- Division of curricula into teaching blocks:
 - Programmes
 - Disciplines
 - Courses
 - ...



Objective Structured Clinical Examination (OSCE)

- Modern way of evaluation of students of healthcare disciplines
 - First Aid
 - Propaedeutics
- Separate module for OSCE Management:
 - OSCE designers, OSCE examiners, OSCE guarantors



definition of OSCE exams



evaluation of students



reporting



statistics about OSCE

OSCE visualisation

MUNI MED

- Moje portfolio
- Přehled výuky
- OSCE**
 - Sketch
 - Execute
 - Report
 - Stats**
- RAT
- Vyukové aktivity
- Rozvrh
- SKlad
- Popis výuky
- Edukační portály
- Studijní materiály
- Reporting
- Administrace
- Nápověda

📄 🔔 👤 🌐 Petra Růžičková ⏻

13. 12. 2022 - 10. 2. 2023

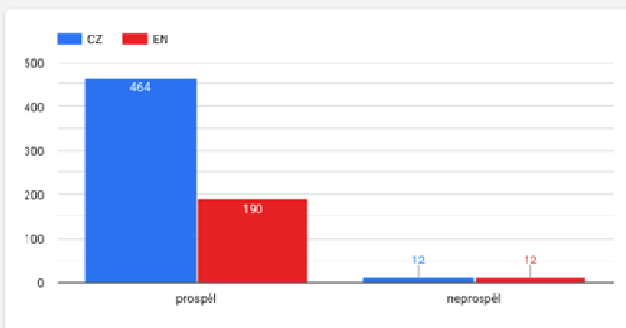
Souhrnné informace

Počet stanic 2	Počet zkoušek 678	Počet zkoušejících 20	Počet studentů 655
Celkem stanic 678	Úspěšnost stanic 96,46 %	Úspěšnost předmětu 99,85 %	Počet změněných hodnocení 8

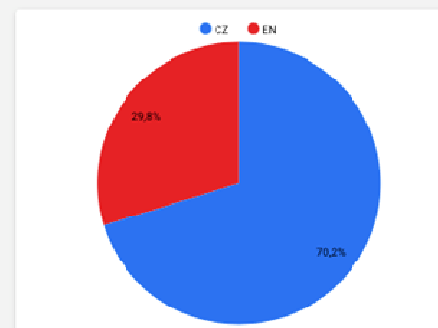
Úspěšnost a rozdělení OSCE stanic podle jazyka

1. pokus 96,49 % 2. pokus 95,45 % 3. pokus 100,00 %

Celkový počet stanic =
678



Úspěšnost studentů podle jazyka, prospěl = student úspěšně absolvoval stanici (včetně opakovaných pokusů)



Rozdělení stanic podle jazyka

Readiness Assurance Test (RAT)

- For Team-Based Learning (TBL)
- Separate module for RAT Management:
 - RAT designers, RAT guarantors, RAT facilitators and students



definition of RAT lessons



running iRAT/tRAT tests
completing RAT tests



statistics about RAT

RAT Stats



- Moje portfolio
- Přehled výuky
- OSCE
- RAT
- Výukové aktivity
- Rozvrh
- Sklad
- Popis výuky
- Edukační portály
- Studijní materiály
- Reporting
- Administrace
- Nápověda

RAT Stats

🔔 👤 Petra Růžicková ⏻

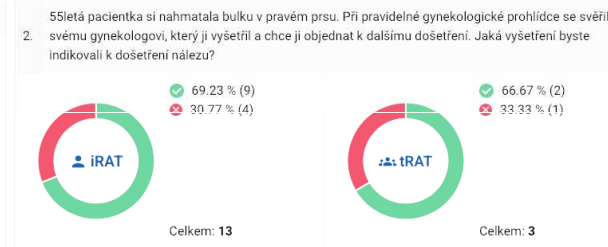
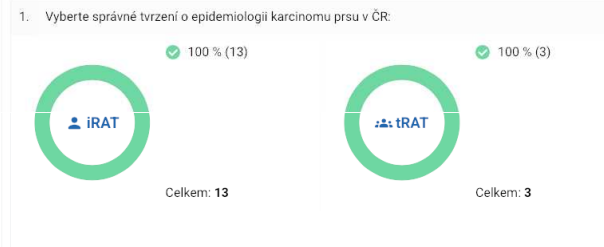
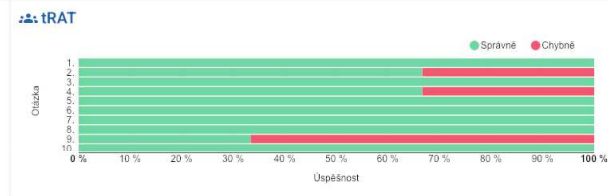
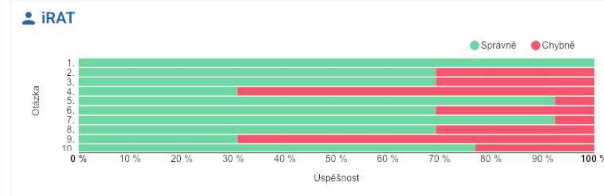
Statistiky testu

Test: 26 - Karcinom prsu | Lekce: 19 - Karcinom prsu | Skupina: Vše | Odpověď: Dle správnosti

13 studentů

[Zobrazit detail testu](#)

Celkový přehled



Statistics are rendered automatically (without the need for processing)



Visualisation of student feedback

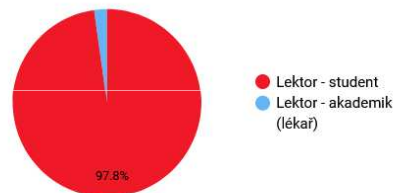
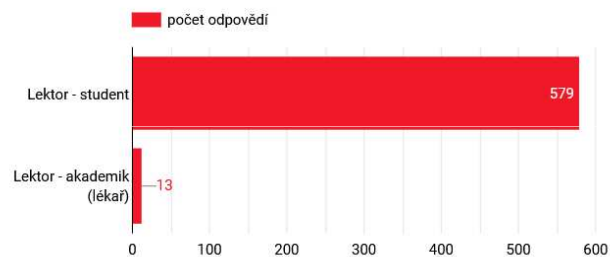
Týden 1. Report slouží pro zobrazení zpětné vazby, kterou poskytují zapsaní studenti předmetů první pomoci po absolvování dané lekce. Počet studentů, kteří vyplnili zpětnou vazbu 595
Pro zobrazení konkrétní seminární skupiny specifikujte výběr pomocí filtrů.

Týden 2.
Týden 3.
Týden 4. seminární skupina - předmet - jazyk -
Týden 5.
Týden 6.

Otázka 1: Tuto lekcí mě provedl:

celkem studentů

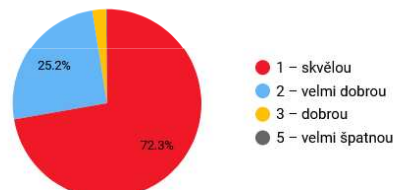
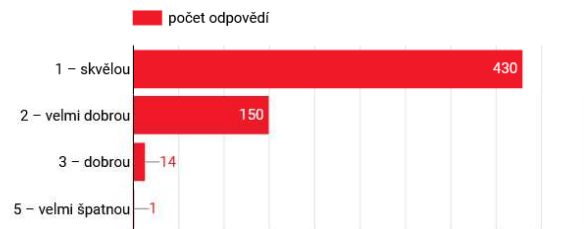
592



Otázka 2: Tuto lekcí hodnotím jako:

celkem studentů

595



Computational biology

Summer school 2022



MUNI
MED

Selected case studies

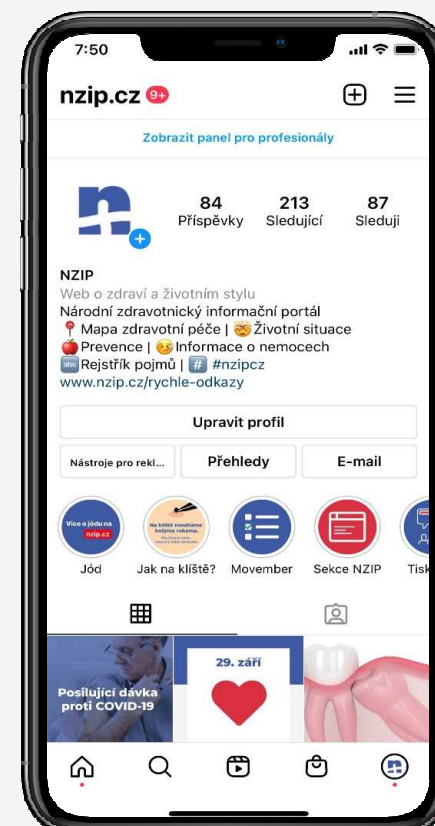
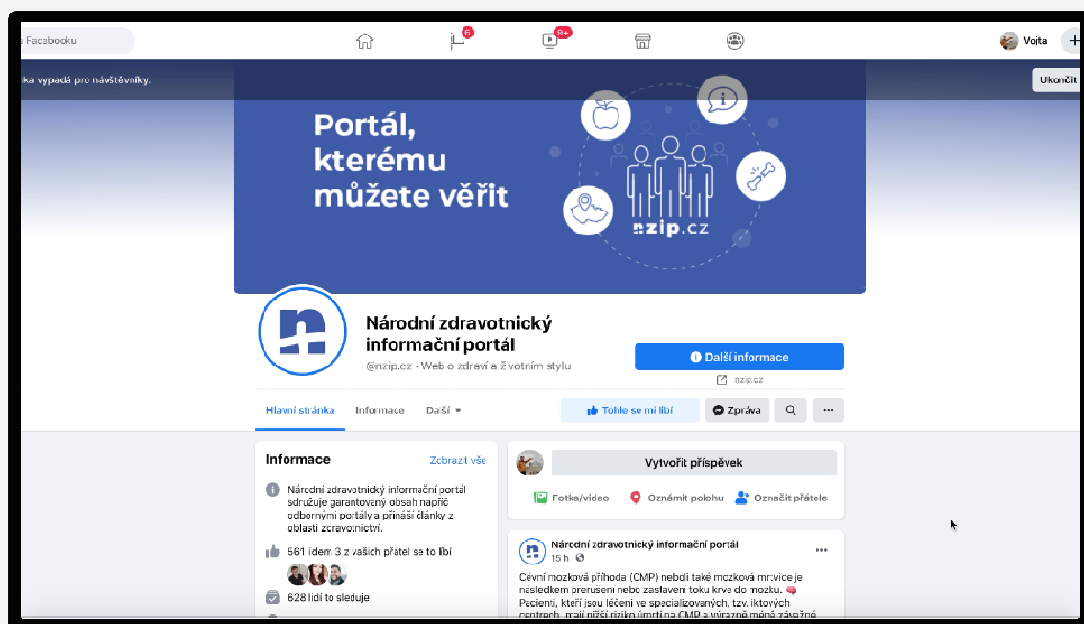
Health information and statistics



National Health Information Portal

23 July 2020

nzip.cz



European Union
European Social Fund
Operational Programme Employment



Communication

Example: COVID-19 vaccination



nzip.cz

Open Data First

Czech National Strategy

<https://psychiatrie.uzis.cz/>, <https://www.nzip.cz/nkis/>
<https://www.nzip.cz/nrrz/>, <https://nsc.uzis.cz/data/>

National portal for psychiatric care

nzip.cz



Region



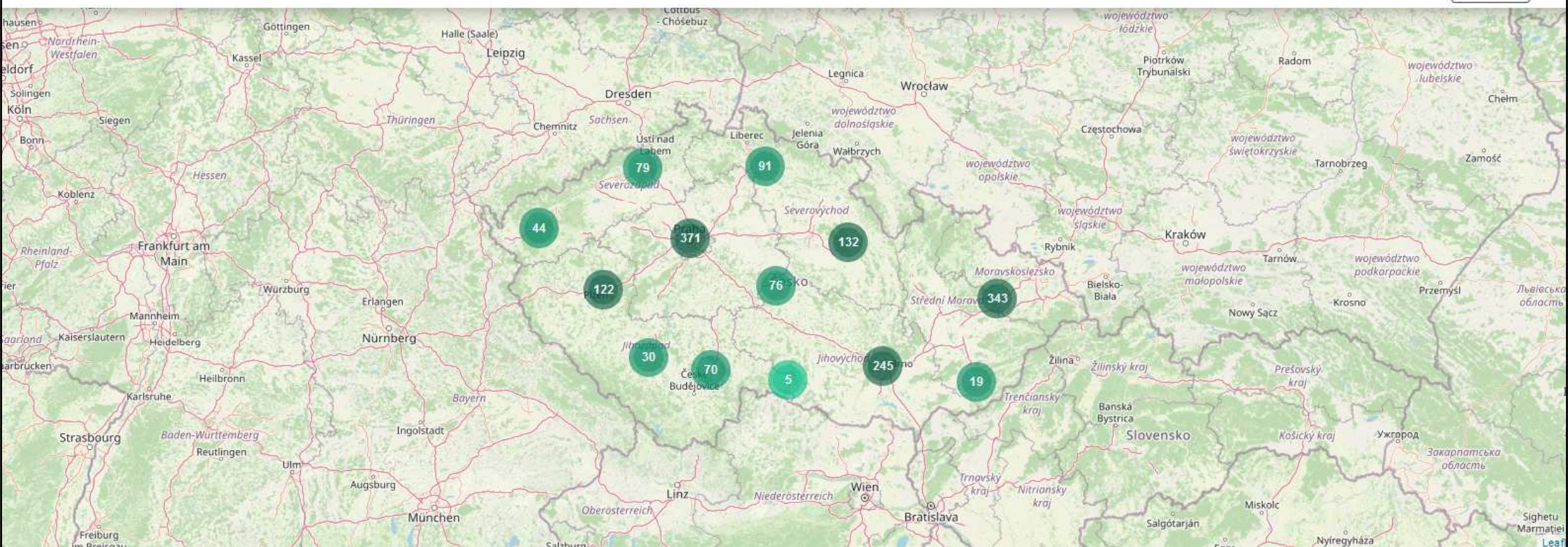
Typ poskytovatele



Typ péče

Vybrané filtry:

Resetovat



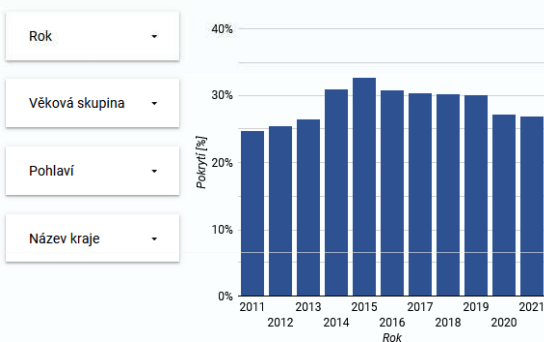
Počet výsledků: 1 627

Zdroj dat: Národní registr poskytovatelů zdravotních služeb a Národní registr hrazených zdravotních služeb

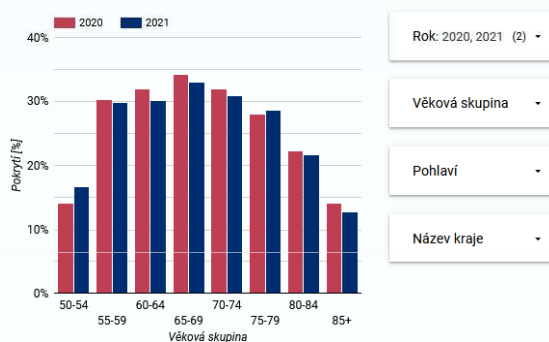
National screening centre

Pokrytí cílové populace screeningovým vyšetřením
ve dvouletém intervalu za rok 2021
(muži i ženy, věk 50 a více let)
26.9%

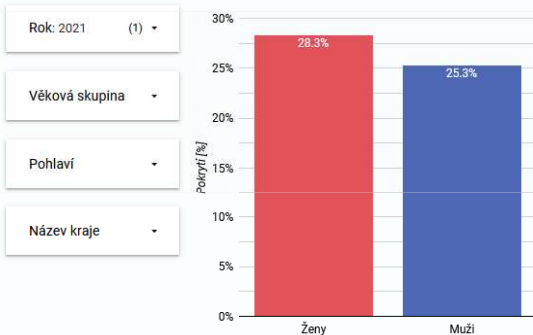
Graf 1: Pokrytí screeningovým vyšetřením ve standardním intervalu v čase



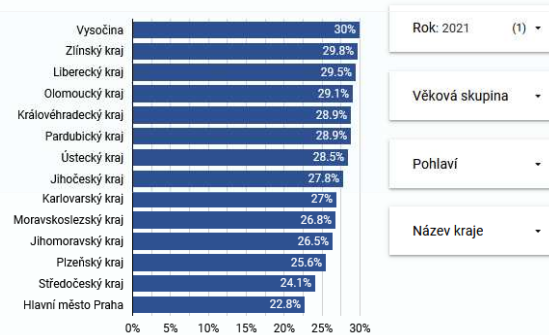
Graf 2: Pokrytí screeningovým vyšetřením ve standardním intervalu v rámci věkových skupin



Graf 3: Pokrytí screeningovým vyšetřením ve standardním intervalu dle pohlaví



Graf 4: Regionální pokrytí screeningovým vyšetřením ve standardním intervalu



National Cardiology Information System

nzip.cz



Národní kardiovaskulární plán



Národní kardiologický informační systém



Zpravodajství NKIS



Analytické studie



Ročenky a publikace



Portál zdravotnických ukazatelů

National Reproductive Health Registry **nzip.cz**



Česká neonatologická společnost



Česká gynekologicko-porodnická společnost



Národní registr reprodukčního zdraví



Ročenky a publikace



Analytické studie



Portál zdravotnických ukazatelů

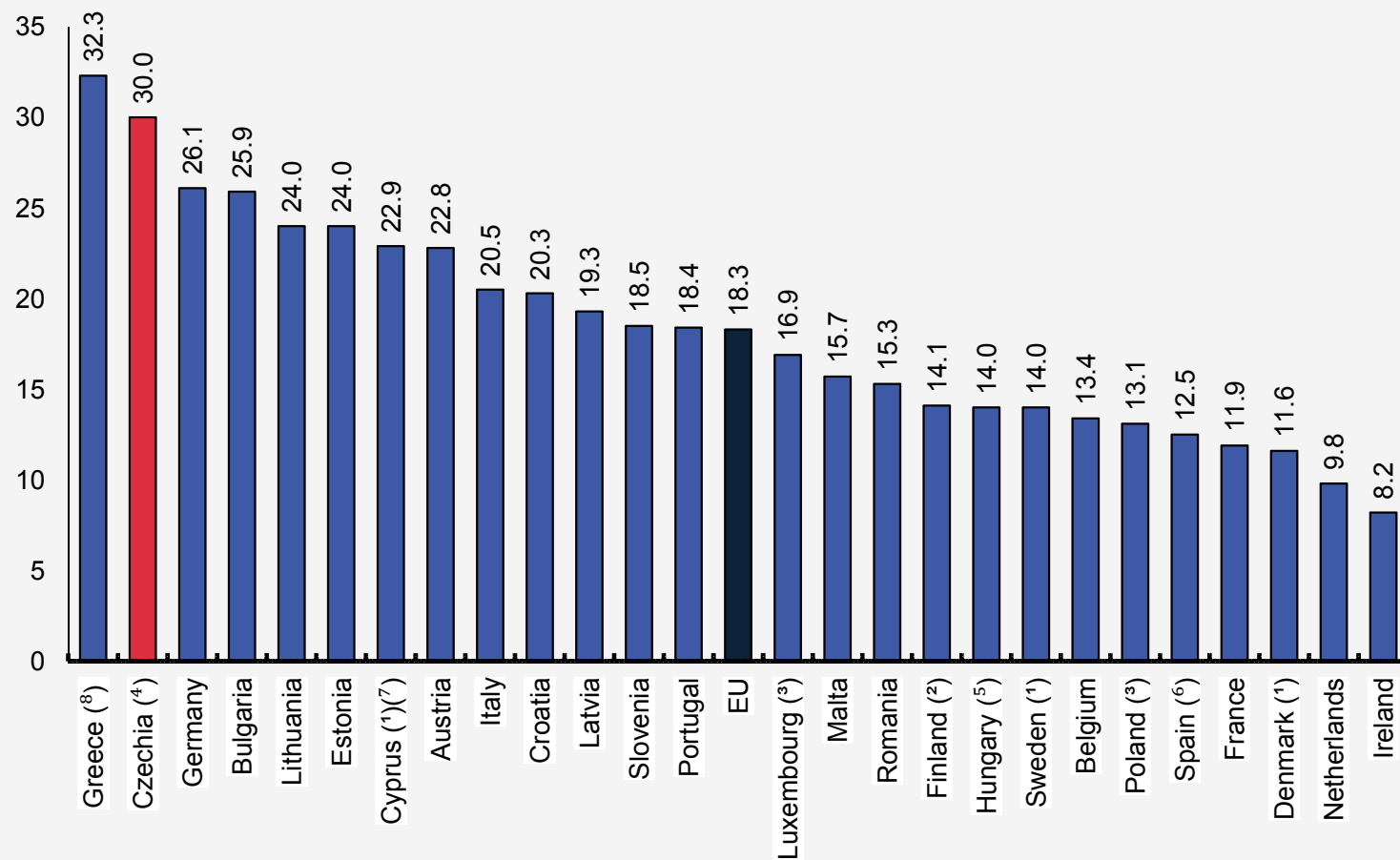


Otevřená data



Datové souhrny

Number of gynaecologists per 100 thousand inhabitants



Interactive visualisation

Přehled počtu porodů za rok 2021

Počet porodů

108371

Rok porodu

2021

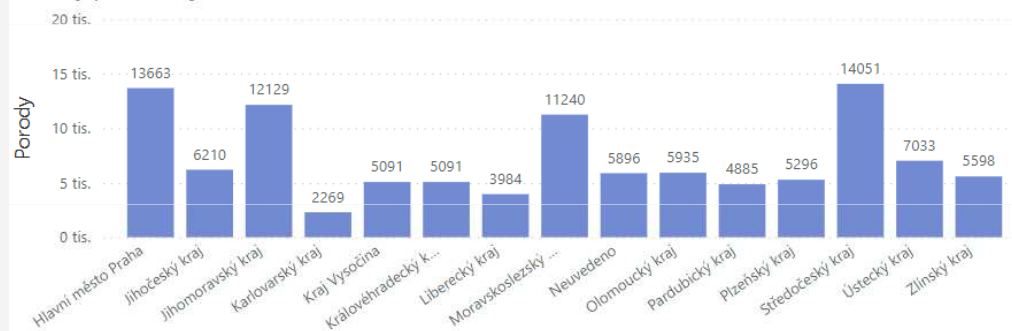
Kraj

Vše

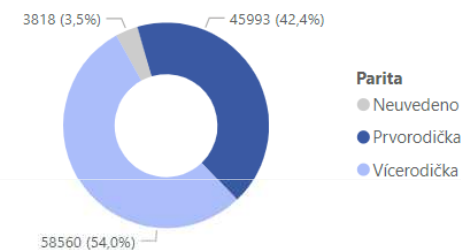
Parita

Vše

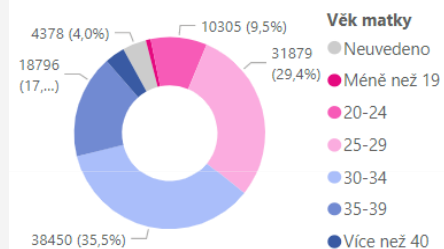
Porody podle krajů



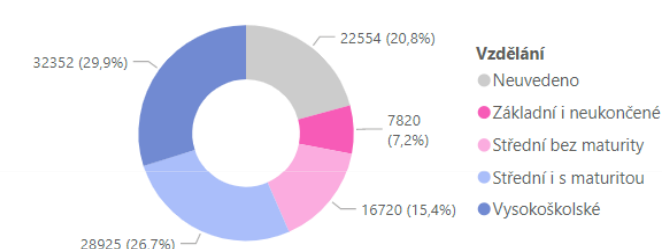
Porody podle parity



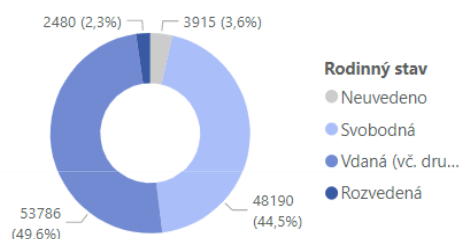
Porody podle věku matky



Porody podle vzdělání

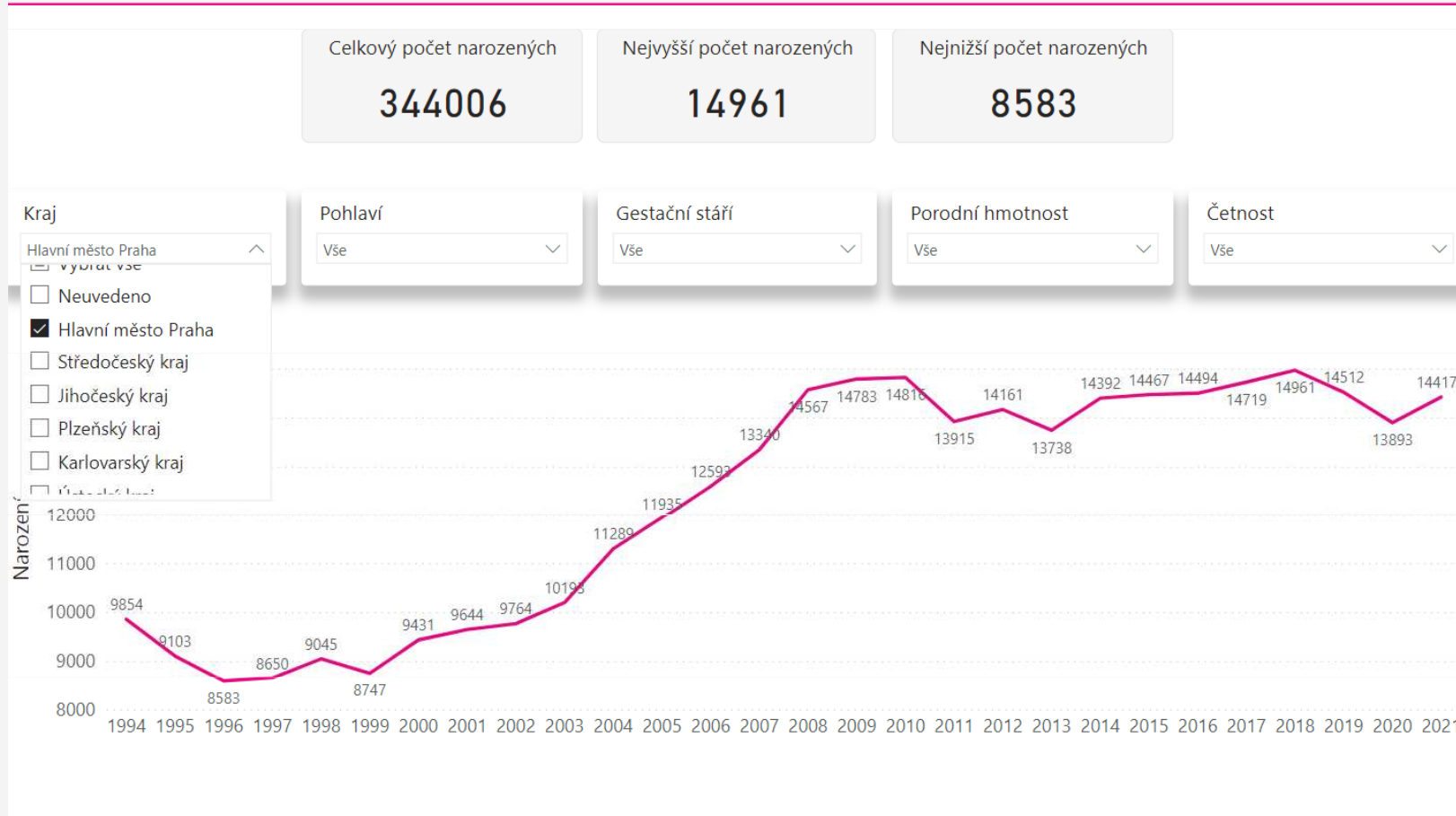


Porody podle rodinného stavu



Interactive visualisation

Časová řada počtu narozených (1994-2021)



National conferences

nzip.cz



And finally, the motivation

Why?

- M** to highlight the real need for data
- M** to showcase real projects
- M** to find similar activities and partners
- M** to spark discussion and develop collaboration

**MUNI
MED**

MASARYK UNIVERSITY
FACULTY OF MEDICINE
INSTITUTE OF BIOSTATISTICS
AND ANALYSES
KAMENICE 3
625 00 BRNO
CZECH REPUBLIC

Martin Komenda, PhD

system analyst, assistant professor

T + 420 549 494 469

M + 420 725 174 940

KOMENDA@IBA.MUNI.CZ

WWW.IBA.MUNI.CZ

**MUNI
MED**