Jornadas de Farmácias Comunitária

IA na saúde : O presente e o futuro da intervenção farmacêutica

Vasco Conceição
Retail and Consumer Health Business Unit Director

What is IQVIA?

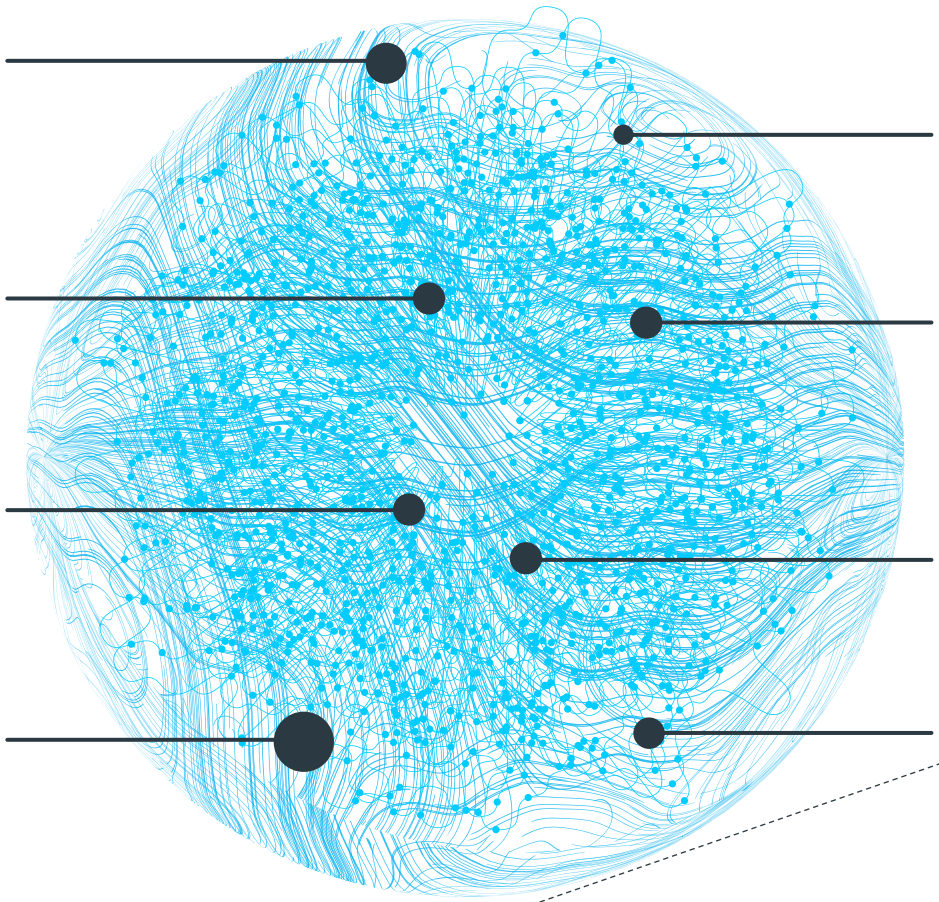
IQVIA is much more than a company that “Buys and Sells Data”. Yes we have access to incredible data…

1.2B+
Non-identified patient records

85%+
Global pharma sales tracked

4.9M
Investigators

60+
Petabytes of unique data



~1M
Data feeds

~26M
Healthcare professionals

400,000+
Sources of social media

150,000+
Data suppliers

2.200 pharmacies in Portugal

Patients

Physicians

Hospitals

Researchers

Pharma

Biomarkers and genomics

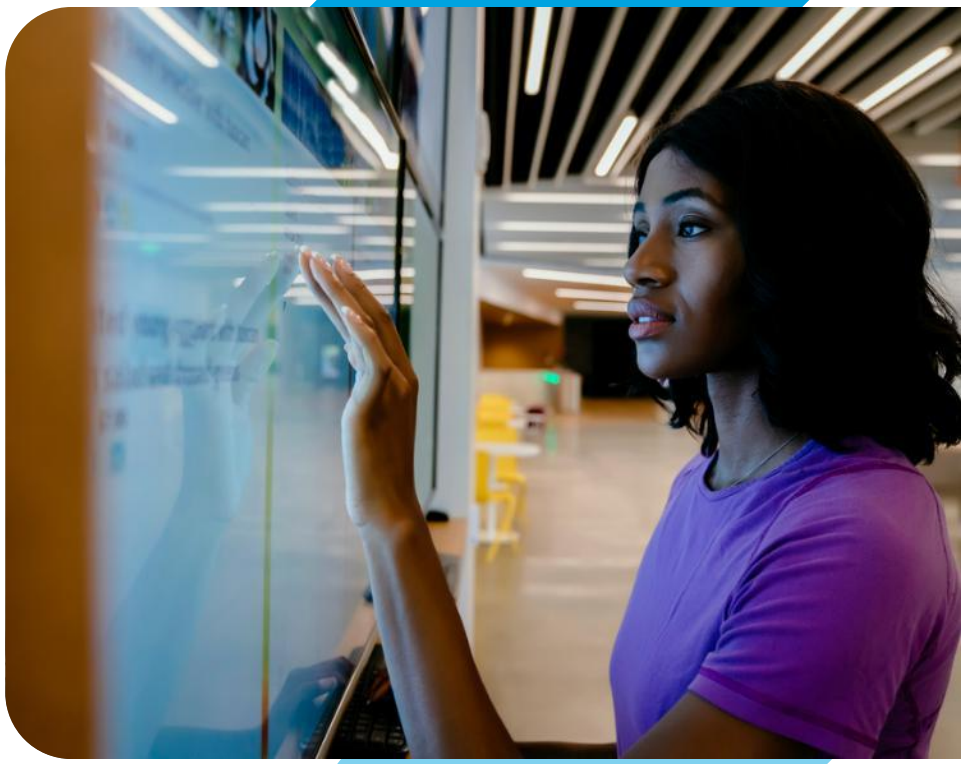
Disease and treatment

Labs and diagnostics

IQVIA Data becomes, Connect intelligence to advance healthcare and improve patient outcomes

Connect intelligence…	… to advance healthcare…	… and improve patient outcomes
Support the European Medicines Agency	1000+ automated therapeutic patient density analytics	1.7X meaningfully higher inclusion of diverse populations
Partner of Gates Foundation	Working with Asian Development Bank	Developed of 90% of 2019’s 50 best drugs
Help manage drug shortages	600+ TB of genomic data	Supporting provide cashless health care services to 500 million of people in India
Support the Creation of the Health Data Space in EU – Darwin Project	>1B non-identified patient records	Implementing dozens of clinical trials in Africa
Provided lab services for 1.6M+ patients in 70+ countries	350K+regulatory documents monitored daily	Developed and scaled academic assays on COVID-19 vaccine

IQVIA and AI



A rich history of developing AI for healthcare

IQVIA's award-winning AI methodologies validated on 100+ diseases

2013

2014 – 2020

2021

2023

IQVIA Connected Intelligence™

Advanced analytics | Complex ontologies | Recursive training machine-learning

Pioneering work which led to development of patented AI/ML routines

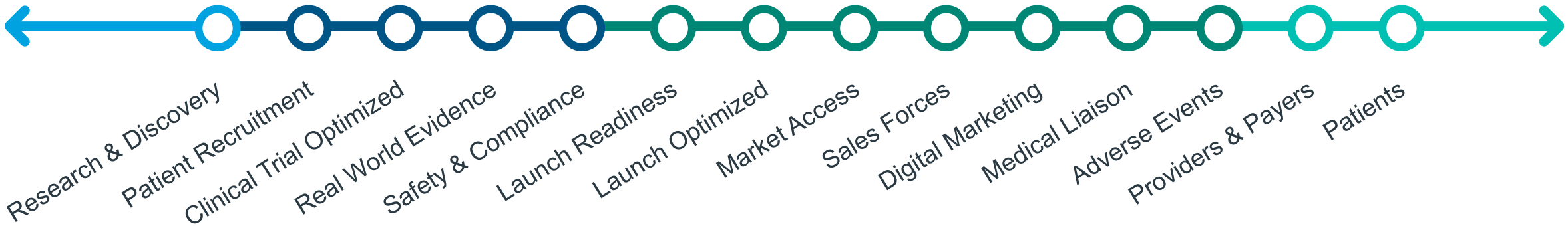
Deploying AI across portfolio:
- R&D trial simulation & site selection
- R&D Smart eTMF
- Safety AE Routing
- Commercial physician targeting
- IQVIA data processing optimization

NLP | Neural networks | Transformers | Large language models | GenAI technology

- R&D trial disclosure (Privacy & IP)
- Medical scientific & KOL data mining
- Medical disease progression models
- Provider social determinants
- General EMR data processing
- 150+ generative AI initiatives in development

200+ peer-reviewed journal articles

IQVIA Healthcare-grade AI® is embedded across the portfolio



DISCOVERY

- Gene & disease mining
- Toxicity and safety prediction

CLINICAL DEVELOPMENT

- Disease burden & patient journey
- Trial planning & simulation
- Probability of regulatory success
- Intelligent eTMF & translations
- Risk-based monitoring
- Safety processing & AE
- CTT de-identification

COMMERCIAL EFFECTIVENESS

- Disease detection & patient journey
- HTA and payor success
- KOL scoring
- Literature landscaping & synthesis
- Medical & regulatory intelligence
- Omni & next best action/message

HEALTH SYSTEMS

- Population health
- Risk adjustment
- Clinical risk and clinical decision support

Predicting risk of stroke, leading to 22% reduction in stroke incidence

IQVIA's Case Study

Background

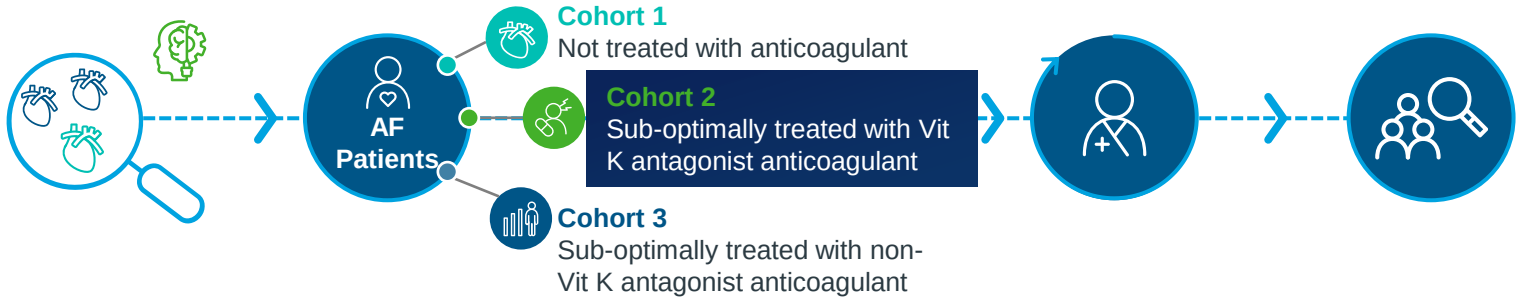
- Atrial Fibrillation (AF) patients are five times more likely to have a stroke than non-AF patients, resulting in increased rates of mortality, morbidity and disability
- A provider organization with ~250,000 patients was looking to design a program to improve the care management of AF patients

Challenge

- IQVIA partnered with the provider organisation to reduce AF-related strokes through identifying at-risk patients and improving use of anti-coagulation therapy

Implementation

- The risk of stroke for AF patients was predicted using EMR data including age, gender, and clinical risk factors (e.g. congestive heart failure, hypertension, stroke/transient ischemic attack, diabetes, vascular disease)



Algorithm identifies AF patients with high risk of stroke

Predicted high risk patients are grouped into cohorts according to type of potential care gap

Records are reviewed by Pharmacist

Selected patients are invited to consultations and recommended for change in therapy

Health impact

The annual number of strokes was estimated to fall by **22%** (114 fewer strokes) during the implementation phase compared to the prior period

Financial impact

This led to an estimated reduction in healthcare burden amounting to an annual saving of **~$2m**, up to **~$7m** when socio-economic factors were taken into consideration

Surfacing hidden SDoH risk factors to prioritize engagement of social workers

IQVIA's Case Study

Background

- NorthShore University Health System recently combined with Edward-Elmhurst Health to become the third largest healthcare delivery system in Illinois
- In the region, significant disparities in life expectancy were observed. Using census tract data — a 22-year difference (the largest in the country) was observed between those who had the longest and shortest life expectancies

Challenge

- Patient level SDOH (Social Determinants Of Health) data was limited to poorly populated structured data within the EMR, while research shows that SDOH factors are documented in over 30% of patients. Northshore required a mechanism to surface this information from unstructured medical records in order to improve triage and prioritization of at risk patients

Implementation

- As a first step in their health equity plan, NorthShore – Edward-Elmhurst Health has turned to IQVIA's award winning AI solution for SDOH NLP to gain greater visibility of the health equity disparities that exist within their population, to better manage these gaps and drive more equitable healthcare
- The solution is deployed in the ED where it screens free text clinician notes and flags patients with SDOH risk factors, enabling more targeted triage of at-risk patients

Impact

- Below is a real example of the AI solution impacting at a patient level

ED patient	Flagged by NLP	Human in the loop	Social worker assessment	Resource & impact
20 to 30 year-old Female Presents with headache, nausea and dizziness	"victim of crime" "Victim of abuse"	Provided summary of EMR, presented info to clinical	Used a trauma-informed approach Allowed patient to share more info	Patient referred to services for PTSD care and legal assistance

ED social workers assessed
<u>56% more patients</u> for SDOH needs that would not have otherwise been identified

Supporting CDC's Antibiotics Stewardship program by flagging drivers of inappropriate prescribing

IQVIA's Case Study

Background

- Antibiotic Stewardship Programs (ASPs) are a key feature to the CDC strategy to address inappropriate prescribing activities, prevent adverse events, and reduce overall development of antibiotic resistance
- ASPs are designed to engage healthcare systems and providers with a toolkit of guidelines, checklists and supporting evidence to change prescribing behavior for antibiotics

Challenge

- Understand non-clinical drivers of inappropriate use of antibiotics
- Develop an interactive UI to understand and visualize variations dynamically

Publication
https://www.cambridge.org/core/journals/infection-control-and-hospital-epidemiology/article/using-machine-learning-to-examine-drivers-of-inappropriate-outpatient-antibiotic-prescribing-in-acute-respiratory-illnesses/A445887ADCC9EA061A3ABDD0DEAE3CE5

Implementation

Leveraged IQVIA's National Medical and Prescription Claims data set covering >250M patients to predict inappropriate antibiotics prescribing and understand the drivers

Access to instant insights in an interactive app

Impact

Allowed CDC to locate geographic hotspots of inappropriate antibiotic prescribing

Identified patient and physician characteristics driving inappropriate antibiotic prescribing

Informed engagement on State Department of Health for targeted Antibiotic Stewardship Programs

PIAPI: Physician Inappropriate Antibiotic Prescription Index

Developing diabetes and cardiovascular care bundles for countrywide deployment

IQVIA's Case Study

Background

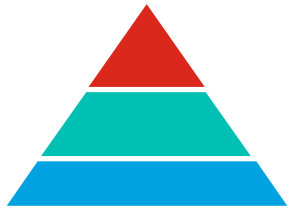
- Client is an Israeli government affiliated health service organization uniquely positioned to develop innovative ways to optimize resource allocation and improve outcomes during COVID-19 pandemic
- An algorithm was developed on Israeli healthcare data to generate a score that evaluates if a patient with COVID-19 is at risk of mortality or severe hospitalization who may benefit from early intervention and provide a near-term forecast on upcoming hospital capacity

Challenge

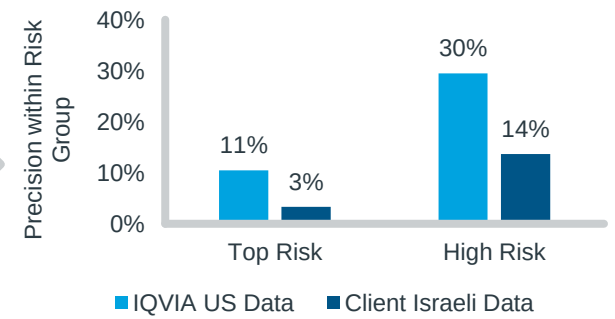
- Client was interested in validating the existing algorithm within the U.S. to evaluate the feasibility of scaling deployment of the algorithm throughout the world to aid healthcare systems

Implementation

IQVIA collaborated with Client to re-estimate and validate the algorithm to identify COVID-19 patients **at-risk of mortality or severe hospitalization** leveraging IQVIA's real world data across Charge Data Master, prescription and medical claims data in the U.S.



COVID patients stratified by risk of mortality or severe hospitalization based on algorithm



Impact

Accelerate global research

During COVID-19 pandemic, there was country-specific research that could be helpful in other geographies

Collaboratively validate impactful solutions

Managing COVID-19 pandemic required all healthcare researchers to work collaboratively on joint research and validate early positive findings in independent datasets

Evaluate scalability of algorithm

Assess the utility of the algorithm for the U.S. market

AI and the Portuguese Community Pharmacist

Before starting:
Let us challenge ourselves to think differently

When looking to what are the intervention areas of a Community Pharmacist, AI might impact it differently

Functional Areas	Impact of AI ?
1. *Dispensa de medicamentos, dispositivos médicos e produtos de saúde e bem-estar*	**1 – 2** – 3 – 4 – 5
2. *Segurança e Farmacovigilância*	**1 – 2 – 3** – 4 – 5
3. *Preparação de medicamentos manipulados*	**1 – 2 – 3 – 4** – 5
4. *Serviços Farmacêuticos*	**1 – 2 – 3**– 4 – 5
5. *Colaboração com instituições do ensino superior e outras.*	**1** – 2 – 3 – 4 – 5
6. *Legislação e regulamentação*	**1 – 2 – 3 – 4 – 5**
7. *Gestão e outros*	**1 – 2** – 3 – 4 – 5

When we look to dispensing, we see multiple AI Tools that can complement/accelerate the pharmacist's work

Dispensa de medicamentos, dispositivos médicos e produtos de saúde e bem-estar

Non-exhaustive

Tasks	Possible AI Tools
Validação da prescrição e reconciliação da terapêutica	*(not yet?)*
Conhecimentos de farmacologia, farmacocinética e farmacoterapia	***AI elearning***
Dispensa de medicamentos com características especiais	*(not yet?)*
Dispensa de medicamentos manipulados	*(not yet?)*
Aconselhamento farmacêutico	***AI Algorithms***
Comunicação com o doente/cliente	***Chatbot***
Colaboração com outros profissionais de saúde	*(not yet?)*
Reconciliação da terapêutica	*(not yet?)*
Conhecimento dos Protocolos e Normas associados	**AI elearning**
Validação da prescrição	*(not yet?)*
Promoção do uso responsável	***GenAI***
Regimes de comparticipação	**AI elearning**
Atuação em caso de falta	**AI Algorithms**

Auxiliar tasks and knowledge can be greatly impact by AI tools if ever implemented

Segurança e Farmacovigilância

Non-exhaustive

Tasks	Possible AI Tools
Identificação, resolução e prevenção de Problemas Relacionados com Medicamentos	***GenAI***
Conhecimento do Sistema Nacional de Farmacovigilância	***E-learning***
Gestão da notificação da suspeita de reação adversa	***GenAI***
Acompanhamento do doente no decurso do processo de notificação	*(not yet?)*
Promoção da farmacovigilância	***GenAI***
Prevenção de reações adversas	*(not yet?)*

Preparação de medicamentos manipulados

Preparação do medicamento Manipulado	*(not yet?)*
Conhecimento das Boas Práticas na preparação de medicamentos manipulados	***AI eLearning***
Conhecimento dos Protocolos e Normas associados	***AI elearning***
Cálculo do preço de venda ao público de medicamentos manipulados	***AI Algorithms***
Regime de comparticipação dos medicamentos manipulados	***AI Algorithms***
Aconselhamento farmacêutico	***AI Algorithms***

While the delivery of the Pharmaceutical Service should not be impacted, supporting tasks could be impacted by AI

Serviços Farmacêuticos

Non-exhaustive

Tasks	Possible AI Tools
Administração de vacinas e medicamentos injetáveis	*(not yet?)*
Conhecimento dos Protocolos e Normas	***AI elearning***
Conhecimento de Contraindicações e precauções especiais	***AI elearning***
Aconselhamento farmacêutico	***AI Algorithms***
Efectuar testes e parâmetros biométricos, bioquímicos e fisiológicos:	***AI Algorithms***
Conhecimento do significado clínico dos resultados e intervenções subsequentes	***AI elearning***
Conhecimento da rede de referenciação	***GenAI***
Revisão da Medicação Acompanhamento Farmacoterapêutico e Reconciliação da Terapêutica	*(not yet?)*
Conhecimento e pesquisa de fontes de informação sobre medicamentos	***GenAI***
Preparação Individualizada da Medicação	*(not yet?)*
Conhecimentos de farmacologia, farmacocinética e farmacoterapia	***AI elearning***
Implementação de Programas de Saúde Pública e Educação para a Saúde	***GenAI***
Colaboração em programas de Redução de Riscos e Minimização de Danos (RRMD)	***GenAI***
Implementação de Campanhas de informação e literacia em saúde	***GenAI***
Colaboração com outros níveis de cuidados de saúde	*(not yet?)*
Colaboração com outros profissionais de saúde	*(not yet?)*
Programas de adesão à terapêutica	***GenAI***
Entrega de medicamentos, dispositivos médicos e produtos de saúde e bem-estar ao domicílio	*(not yet?)*
Conhecimento das condições e requisitos da entrega ao domicílio	***AI elearning***

While collaboration should remain a mostly without AI involved, when looking to Legislation and rules, the impact can be imense

Colaboração com instituições do ensino superior e outras

Non-exhaustive

Tasks	Possible AI Tools
Orientação de estágios curriculares e extracurriculares	*(not yet?)*
Colaboração noutras atividades de apoio a instituições de ensino superior e outras	*(not yet?)*
Participação em programas/projetos –piloto	***GenAI***

Legislação e regulamentação

Conhecimento da legislação aplicável a todas as Áreas Funcionais	***AI eLearning***
Conhecimento da Legislação aplicada à ética e deontologia profissional	***AI elearning***
Conhecimento da legislação de suporte à farmácia comunitária	***AI elearning***
Conhecimento da Organização dos serviços integrados no sistema de saúde	***AI elearning***
Referenciação de utentes	***AI Algorithms***

While AI can increase the efficiency of Management, marketing and sales, there are some manual task that can't be automated

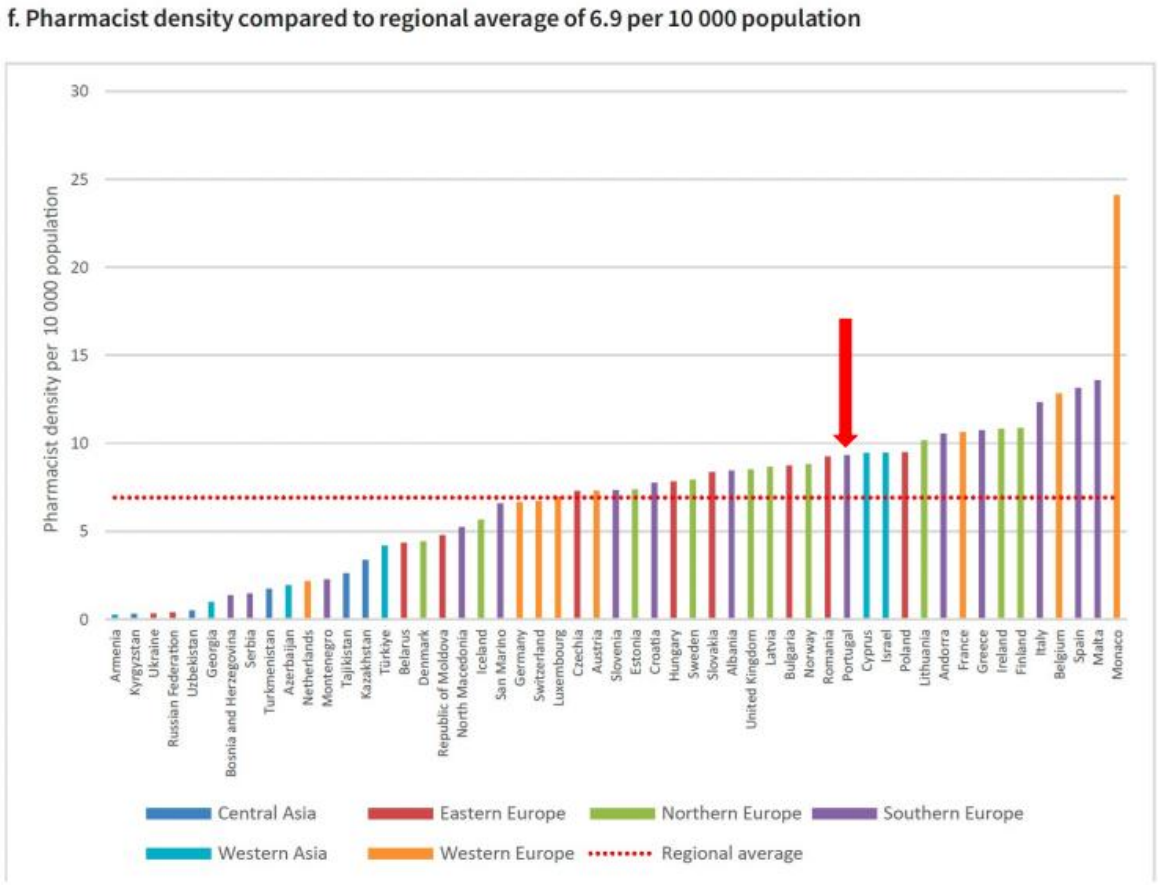
Gestão e outros

Non-exhaustive

Tasks	Possible AI Tools
Gestão Estratégica e Planeamento	***GenAI***
Gestão Económico -Financeira.	***AI Algorithms***
Gestão de Stocks e Compras.	***AI Algorithms***
Gestão de Recursos Humanos.	*(not yet?)*
Gestão da Comunicação Interna e Externa.	***Gen AI***
Gestão da Qualidade	***AI Algorithms***
Higienização	*(not yet?)*
Manutenção	*(not yet?)*
Calibração/ensaio/verificação	*(not yet?)*
Validação	*(not yet?)*
Saúde e Segurança no Trabalho	*(not yet?)*
Comunicação com o doente/cliente	***Chatbot***
Comunicação no ponto de venda	***GenAI***
Estratégias de marketing	***GenAI***

There are reasons many reasons AI is so relevant right now

- The dynamics (Pedro Pita Barros, 2024)
  - Ageing healthcare workforce with heavy retirements in the next decade
  - Accelerated burnout from COVID-19
  - Migration patterns within Europe lead to uneven distribution



- Why this will be even more important:
  - “A global health workforce shortage of 10 million health workers by 2030”, (Boniol et al, 2022, BMJ Global Health)
  - Europe: “We could face a crippling shortage of nearly 1.8 million healthcare workers, and the numbers are climbing,” Hans Kluge, European Health Forum Gastein, 2023

AI can be a help suppress workforce shortage, improve work-life balance and focus on what really matters, people

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