

« Avalanche de données, diversité de la recherche »

Anita Burgun, MD, PhD

Ecole d'été Interdisciplinaire en Numérique de la Santé 2023



Avalanche des données

La valeur des données de vie réelle (RWD) soulignée par l'OMS lors de la pandémie COVID



- Le développement de la santé numérique au niveau mondial va permettre aux populations d'accéder à des « standards de santé » plus élevés.
- Stratégie de l'OMS basée sur un réseau de 5 millions de professionnels de santé.
- Se préparer pour faire face à de nouvelles crises.
- **WHO & IMIA joint program, 1st meeting on Dec 16th, 2020 : dialogue with WHO director general**
- Innovation responsable en IA
- Développer des programmes de prise en charge des patients avec le numérique (santé mentale)
- **Capturer les données à partir du système de santé (routine care)**
- **« Infodemic » infodémiologie**

Identification de populations spécifiques hospitalisées basée sur le code CIM10

Identification des patients atteints d'insuffisance cardiaque sur le code CIM10 I50x

- Bosco-Lévy P, Duret S, Picard F, Dos Santos P, Puymirat E, Gilleron V, Blin P, Chatellier G, Looten V, Moore N. Diagnostic accuracy of the International Classification of Diseases, Tenth Revision, codes of heart failure in an administrative database. *Pharmacoepidemiol Drug Saf.* 2019 Feb;28(2):194-200.
- Insuffisance Cardiaque = 1 million de personnes en France, 2 milliards d'euros par an
- Codage ICD-10 I50.x (PMSI).
- 2 hôpitaux: Bordeaux et HEGP. Revue des dossiers avec I50x en utilisant les critères de la European Society of Cardiology diagnostic criteria. Patients avec un diagnostic d'IC dans leur dossier et recherche de la présence du code I50x.
- Tirage au sort de 200 cas de HF selon le PMSI, and 229 patients selon le DPI.
- **La valeur prédictive positive des codes I50.x est 60.5% (95% CI, 53.7%-67.3%)**
- **La sensibilité des codes I50.x est 64.2% (95% CI, 58.0%-70.4%).** La VPP était similaire dans les 2 hôpitaux, mais la sensibilité variait selon la source et était plus élevée pour les codage faits en cardiologie que dans les services non spécialisés.

Capturer les données du système de santé : données textuelles du dossier patient

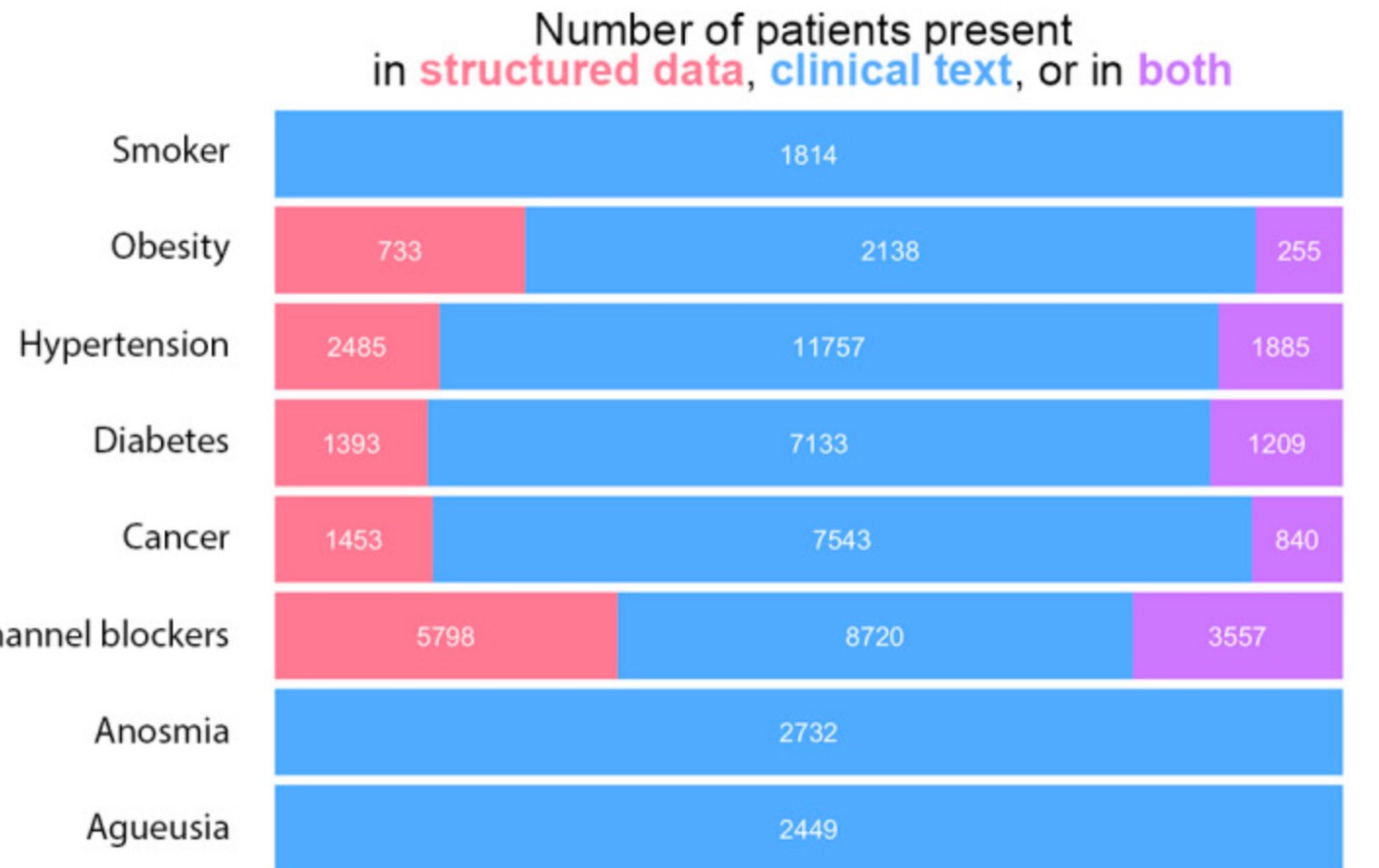
Identifier les patients COVID avec une hypertension traitée par inhibiteurs calciques

**EDS AP-HP 39 hôpitaux
1^{ère} vague COVID**

Si on compare aux données structurées, le NLP augmente le nombre de patients éligibles X 3

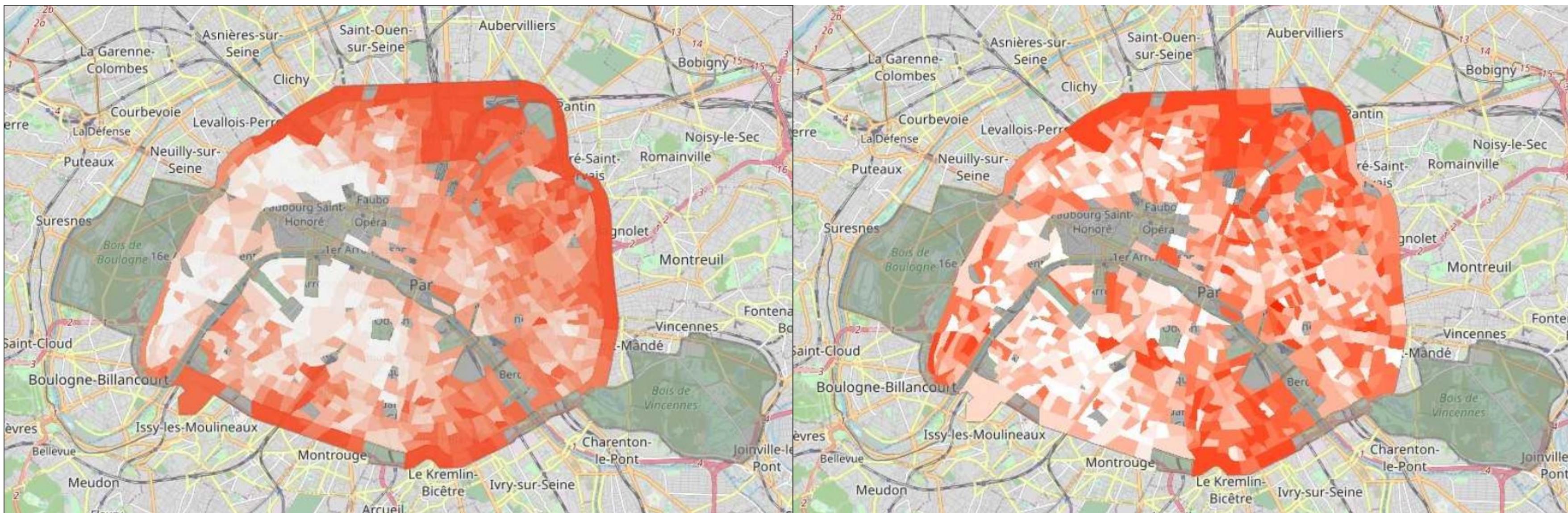
La quantité d'information sur le traitement médicamenteux multipliée par 7

La quantité d'information sur les autres phénotypes multipliée par 12



Neuraz A et al. Natural Language Processing for Rapid Response to Emergent Diseases: Case Study of Calcium Channel Blockers and Hypertension in the COVID-19 Pandemic. J Med Internet Res. 2020 Aug 14;22(8):e20773.

« Creating and analyzing geospatial data are now central to most scientific domains » Doug Richardson. Harvard University



Programme GeoCancer



Explorer par région
Explorer les données par clusters

Intégrer d'autres paramètres (e.g, revenus, données environnementales)

Deep Learning prediction of cancer prevalence from satellite imagery

Bibault JE, et al. Cancers, 2021

Deep learning (CNN, transfer learning) pour analyser les images satellite

Et prédire la prévalence de cancer.

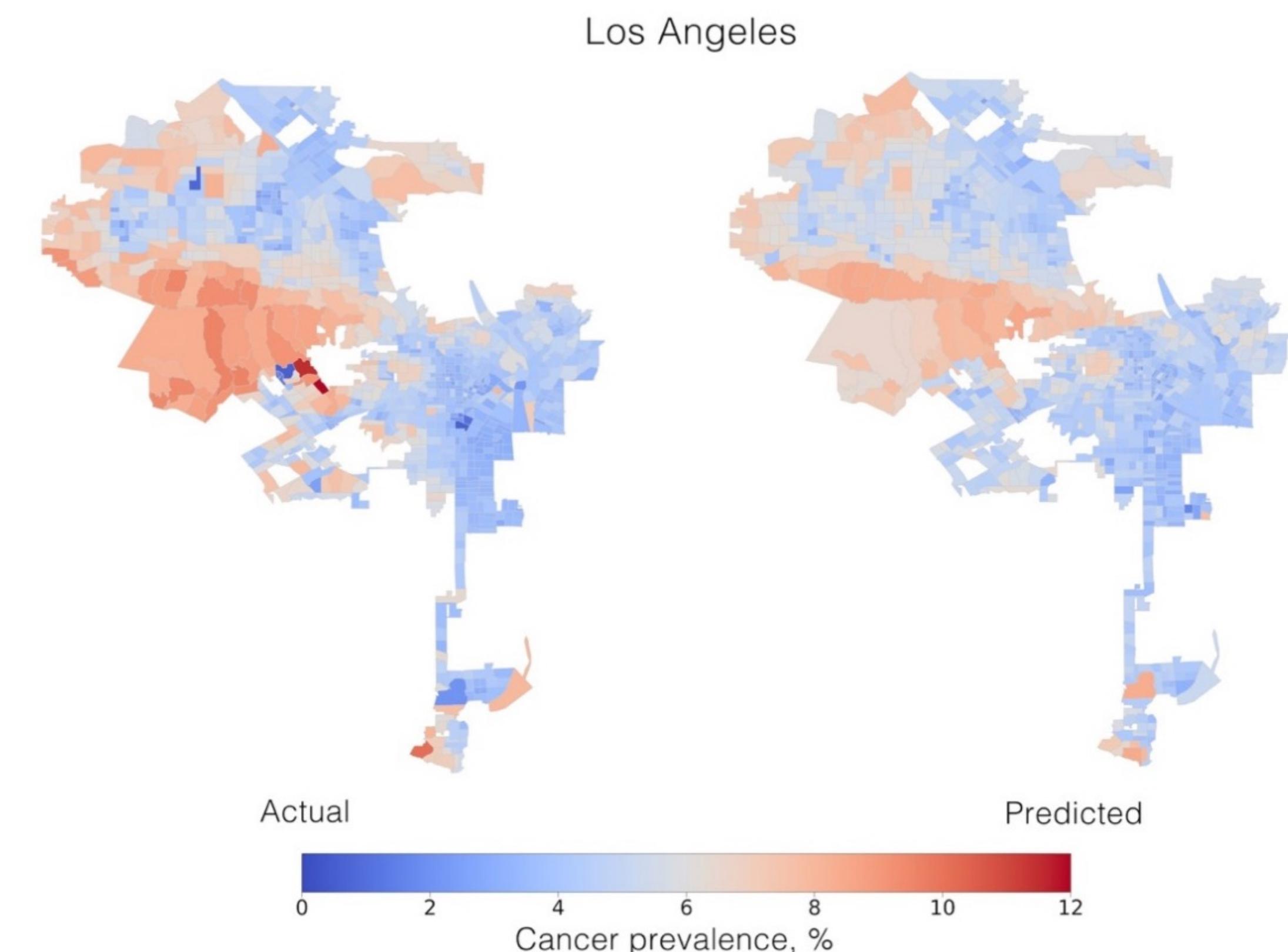
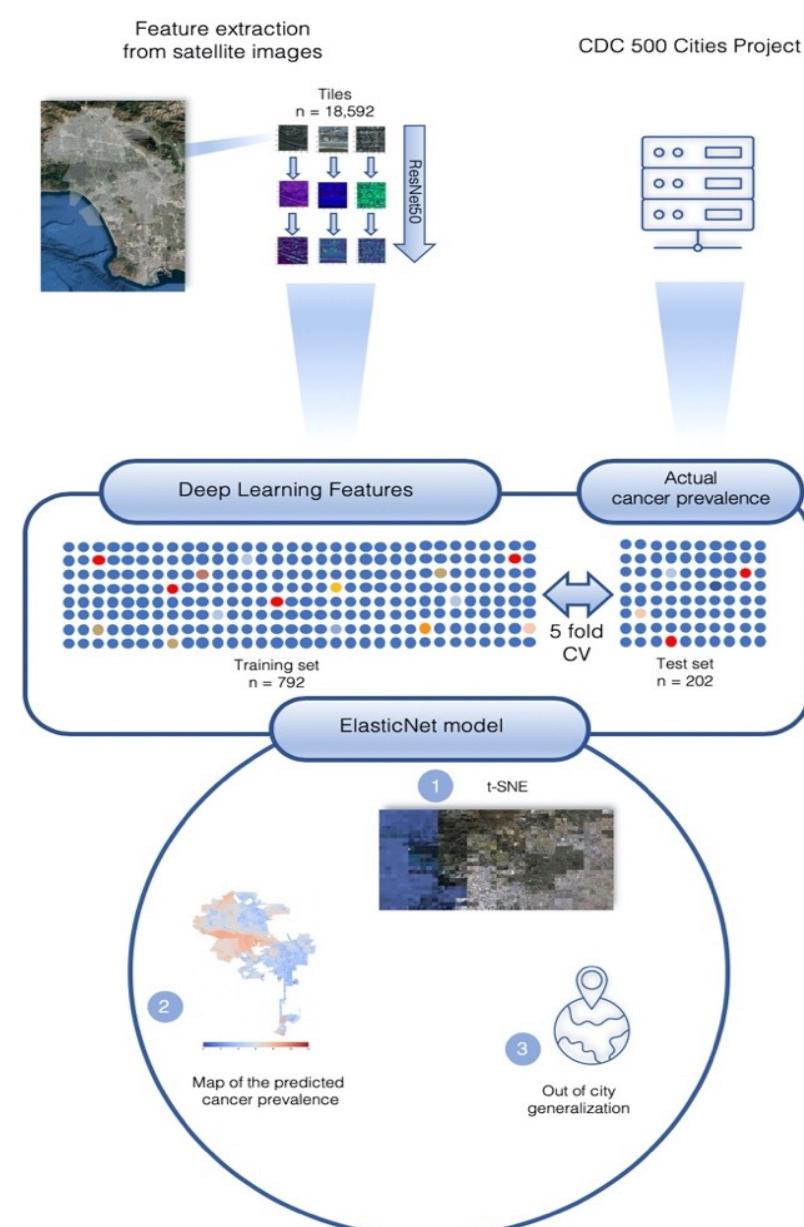
Population d'étude : 14 millions d'habitants

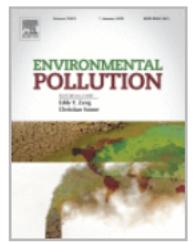
Chicago, Dallas, Houston, L.A, Phoenix, San Diego, San Jose

Prévalence réelle moyenne cancer 5%

Cas de cancer-> adresse -> images satellite → feature extraction
-> prédiction

Explique jusqu'à 64% de la variation de prévalence du cancer.





OPEN ACCESS PEER-REVIEWED
RESEARCH ARTICLE

Contributions of neighborhood social environment and air pollution exposure to Black-White disparities in epigenetic aging

Isabel Yannatos, Shana Stites, Rebecca T. Brown, Corey T. McMillan

Published: July 5, 2023 • <https://doi.org/10.1371/journal.pone.0287112>

Childhood exposure to non-persistent pesticides and pubertal development in Spanish girls and boys: Evidence from the INMA (Environment and Childhood) cohort

Francesca Castiello ^{a b}, Beatriz Suárez ^{b c d}, Andrea Beneito ^e, María-José López-Espínosa ^{c e f}, Loreto Santa-Marina ^{c h i}, Aitana Lertxundi ^{c g h}, Adonina Tardón ^{c j}, Isolina Riaño-Galán ^{j k}, Maribel Casas ^{c l m}, Martine Vrijheid ^{c l m}, Nicolás Olea ^{b c d n}, Mariana F. Fernández ^{b c d n}, Carmen Freire ^{b c d}



Articles ▾ Authors ▾ Podcasts Videos Journal Info ▾ More ▾

Lien entre l'environnement et les maladies

"
ite
<
are
★
orites
3
1--

CLINICAL EPIDEMIOLOGY: CHRONIC KIDNEY DISEASE

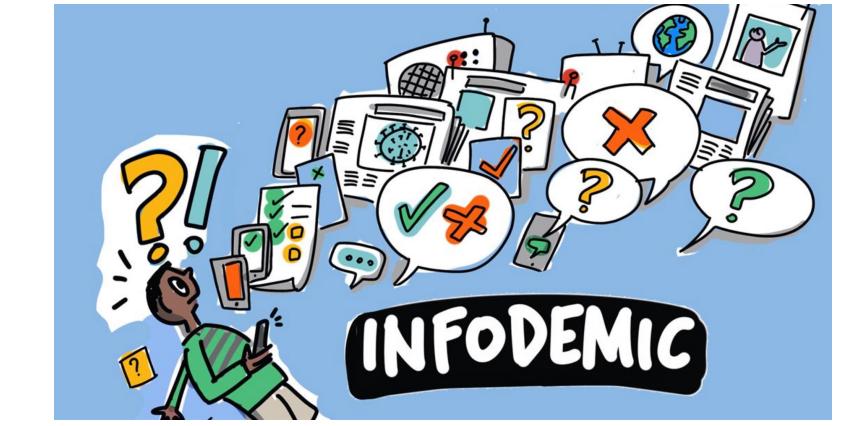
Structural Racism, Historical Redlining, and Incidence of Kidney Failure in US Cities, 2012–2019

Nguyen, Kevin H.^{1,2}; Buckle-Rashid, Rachel^{3,4}; Thorsness, Rebecca^{2,5}; Agbai, Chinyere O.⁶; Crews, Deidra C.^{7,8}; Trivedi, Amal N.^{2,9}

[Author Information](#)

Journal of the American Society of Nephrology ()10.1681/ASN.0000000000000165, June 12, 2023. | DOI:
10.1681/ASN.0000000000000165

D'autres sources de données : les réseaux sociaux



Abdellaoui R et al.
JMIR 2018
Detec't database

**3,650 posts escitalopram
(Seroplex) (Lexapro)
(Cipralex)...**
**Antidepresseur
Selective serotonin
reuptake inhibitors (SSRI)**

**2,164 posts aripiprazole
(Abilify)**
Antipsychotique

Topics found in each corpus ranked by the number of messages

Escitalopram	Aripiprazole
General themes	Interruption
Prescription	Patient experience
Anxiety, panic attacks	General themes 1
Day-to-day condition	Treatment duration
Patients experiences	Various social interactions
Weights gains	Prescription
Interruption	Insomnia
Condition improvement	Interactions between patients
Adverse effects	Treatment effects
Dosage modifications	Dosage modifications
Activities	General themes 2
Treatment effects	-
Duration of treatment	-

Globalement 6% des messages



Avalokitesvara

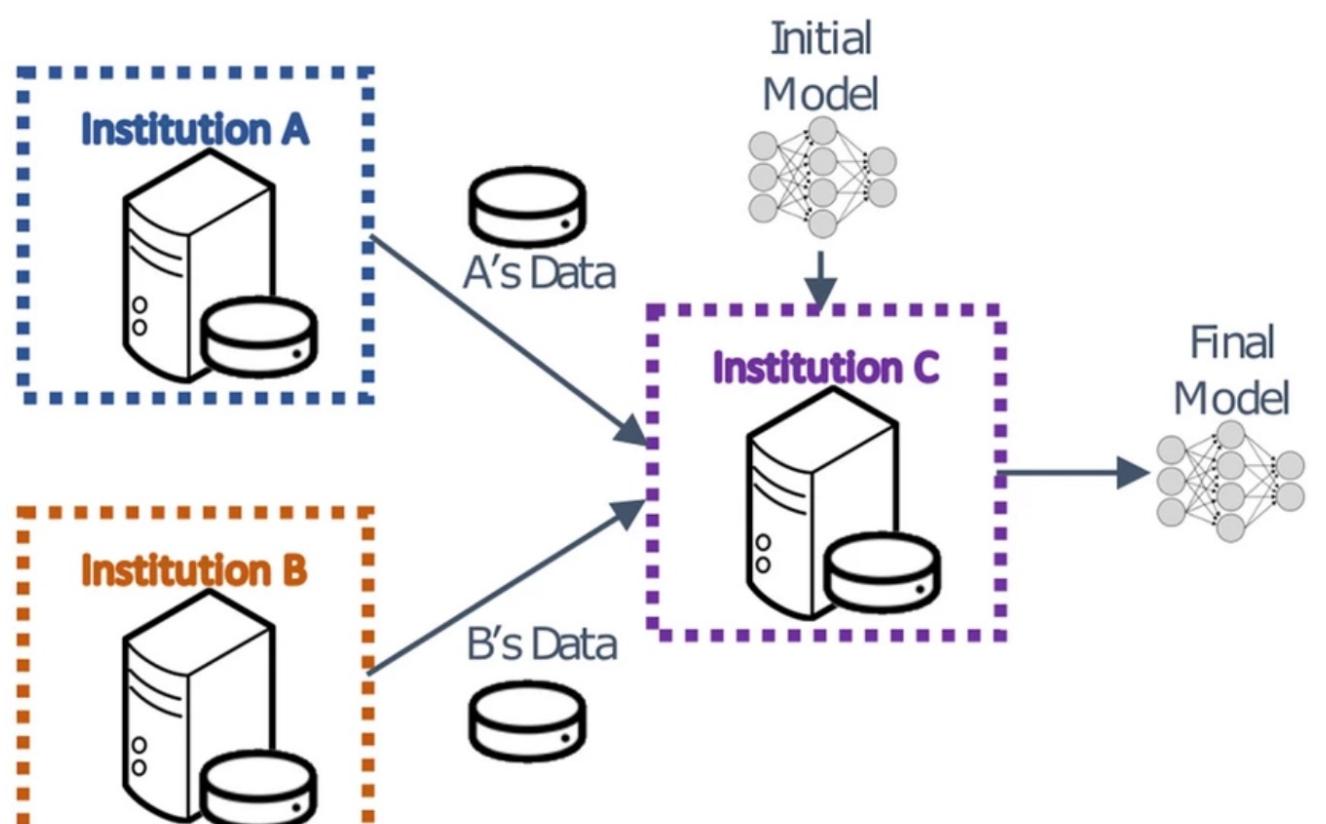
Diversité des recherches

Comment faire de la recherche sur un réseau d'entrepôts ?

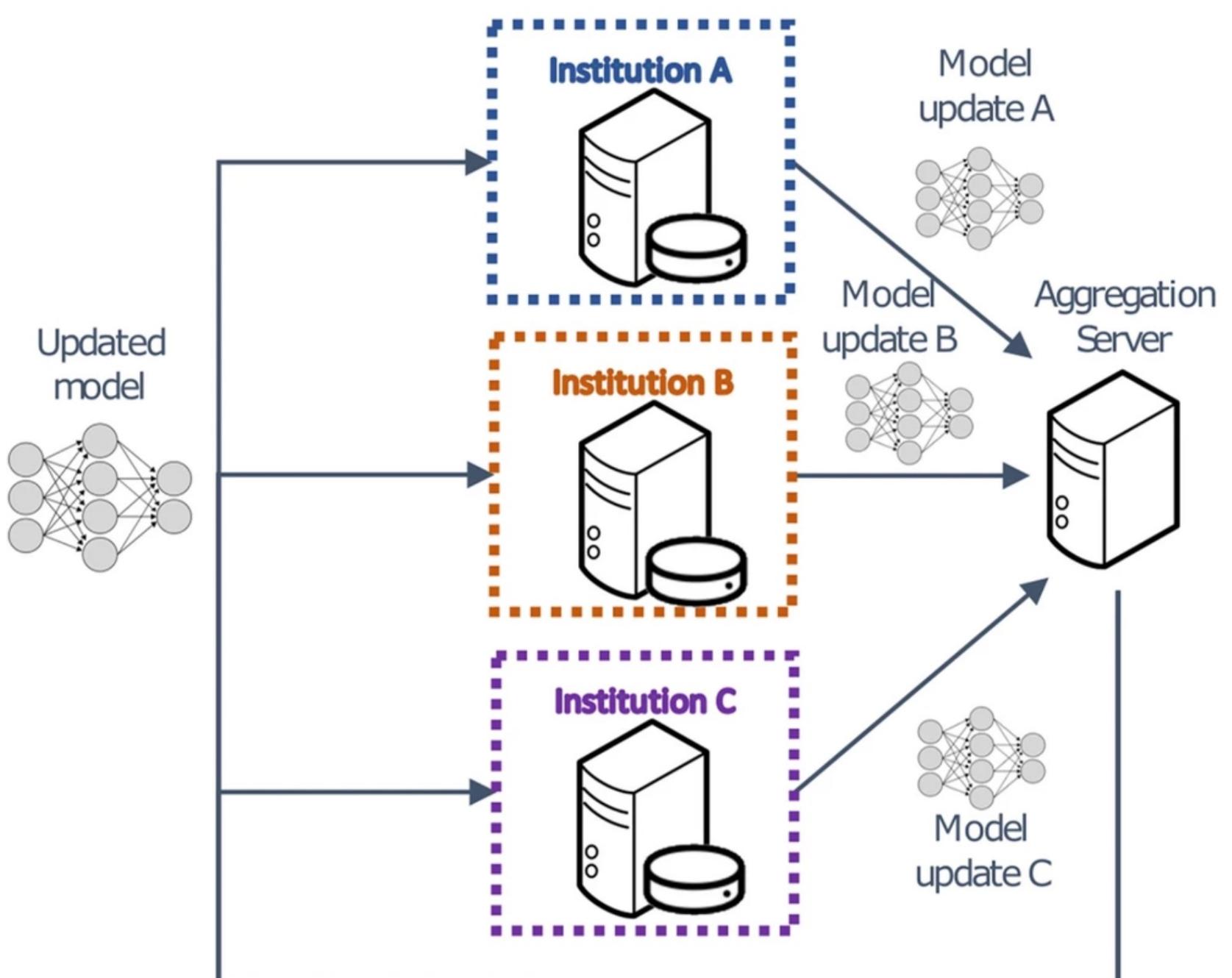
Vers un modèle fédéré

Des approches fédérées

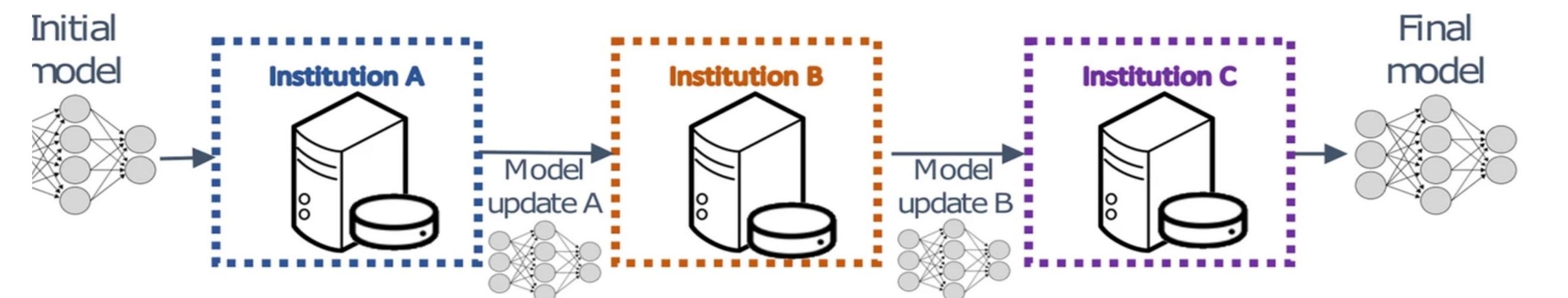
a data-private collaborative learning method



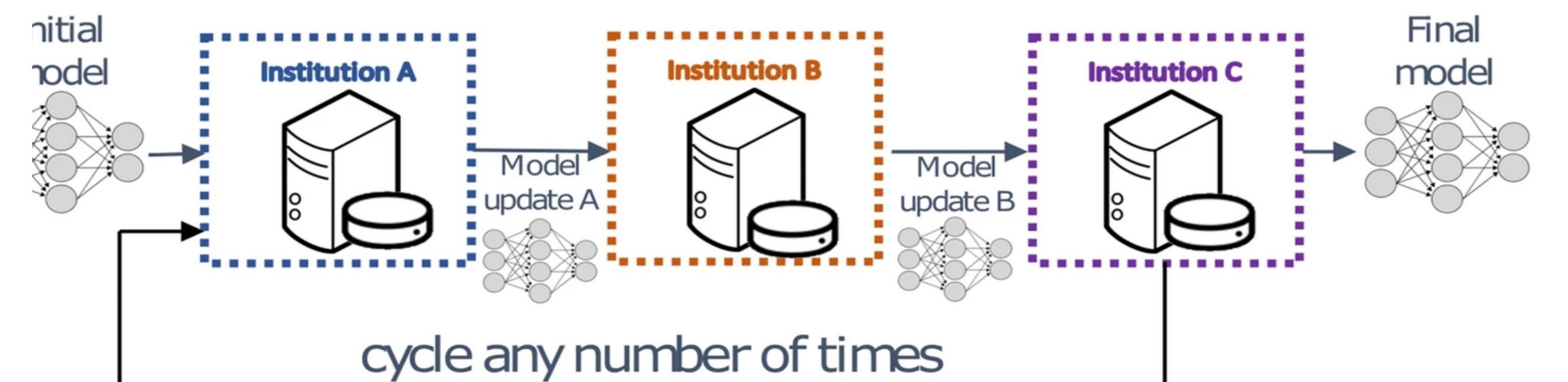
(a) Collaborative Learning through Centralized Data Sharing



(b) Data-private Collaborative Learning using Federated Learning



(c) Data-private Collaborative Learning using Institutional Incremental Learning

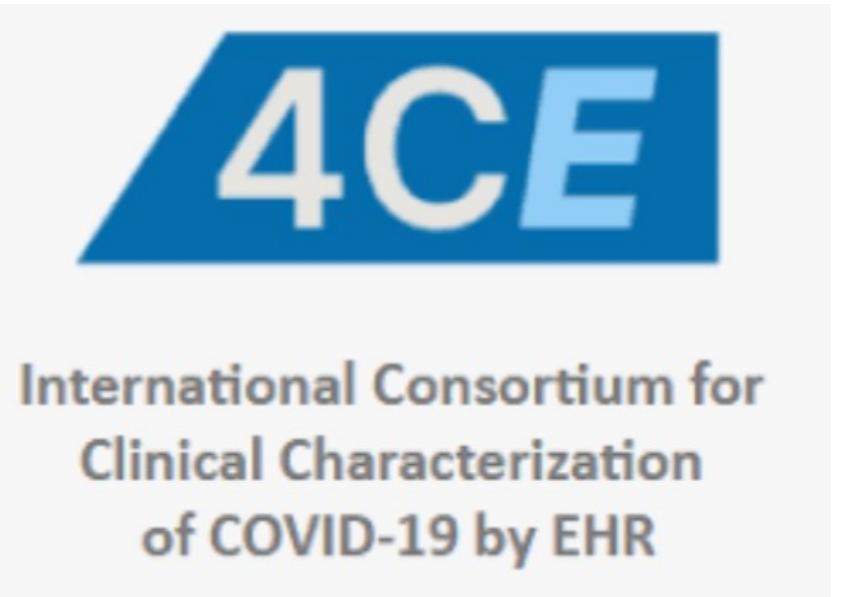


Data-private Collaborative Learning using Cyclic Institutional Incremental Lear

M. J. Sheller et al., *Federated learning in medicine: facilitating multi-institutional collaborations without sharing patient data*, Sci. Rep., vol. 10, no 1, p. 12598, 2020,

Des approches fédérées pour la recherche

**Modèles de données communs
(<« interopérabilité »>)**



Confidentialité

**Contrôle par les sources/ producteurs
de données**



**Recrutement facile de nouvelles
sources de données**

Passage à l'échelle facile (international)

**Modèle adopté par des réseaux
internationaux**



Adopté par des pays (Canada)

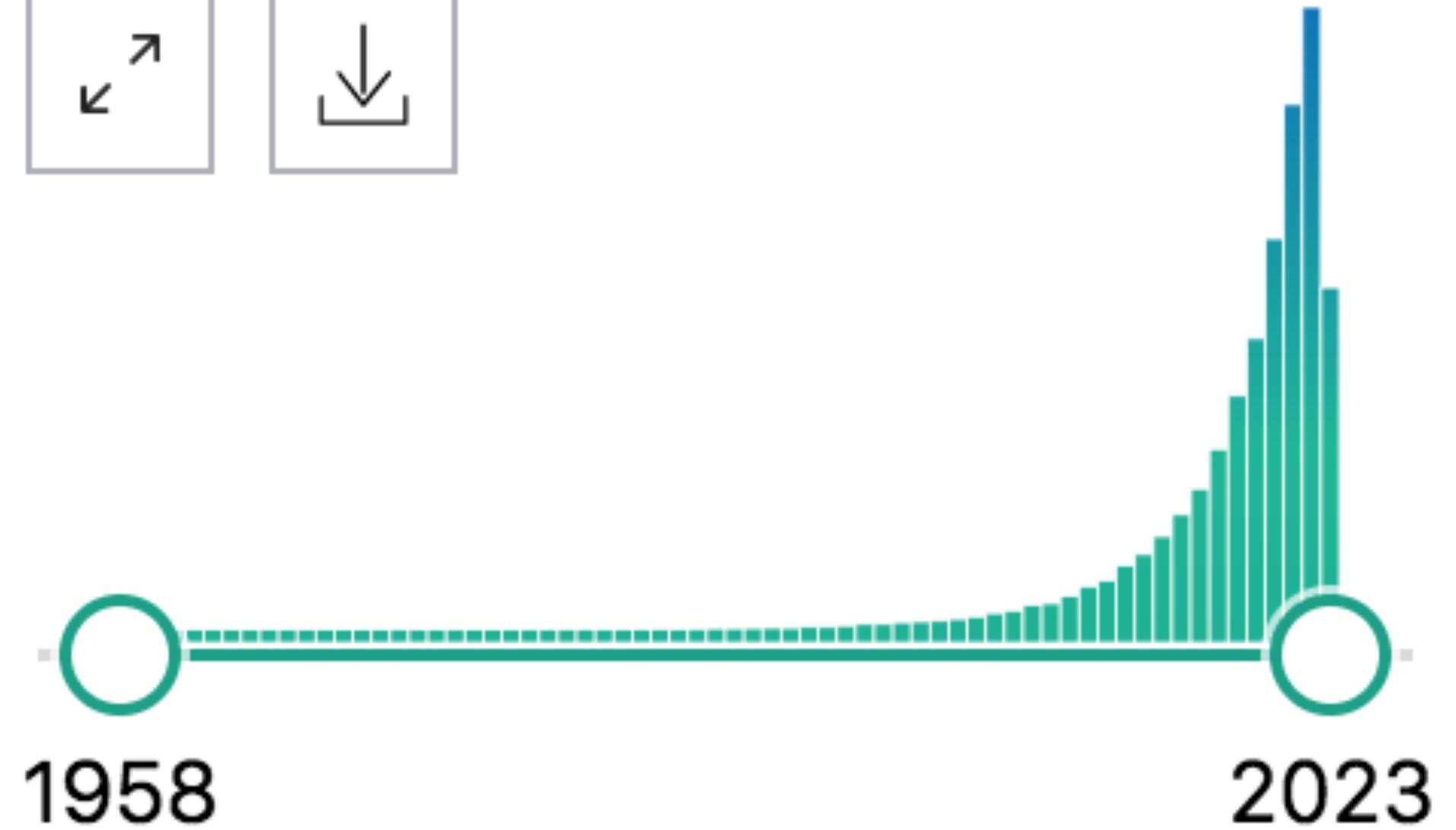
« PARS3 permet de traiter des données qui sont distribuées à travers des systèmes informatiques distincts et de les mettre en réseau de manière cohérente et compréhensible. »
Jean-François Ethier, codirecteur scientifique du GRIIS



**De quelle recherche est-il
question?**

**Surtout... de quelles
découvertes médicales ?**

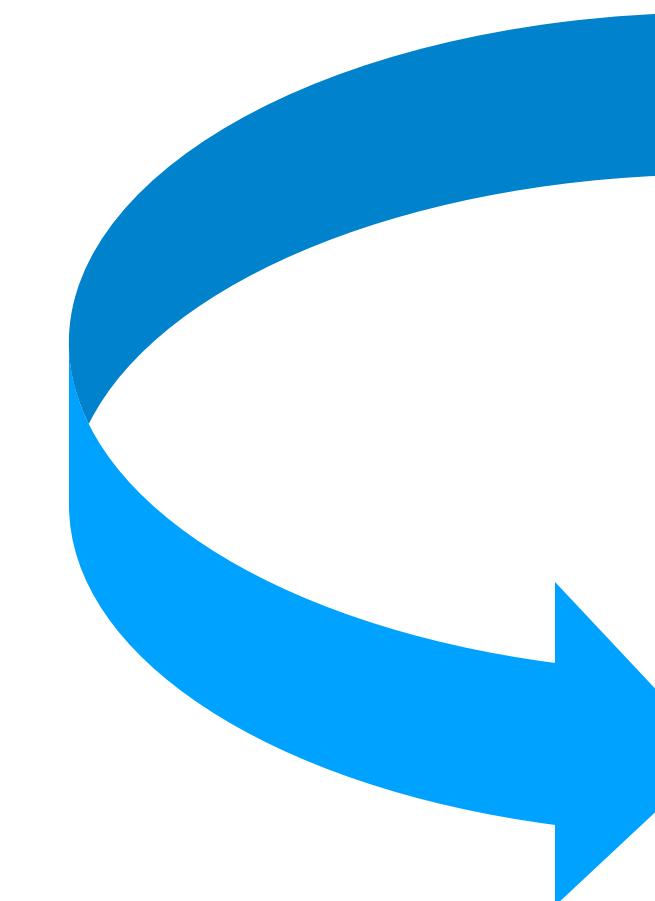
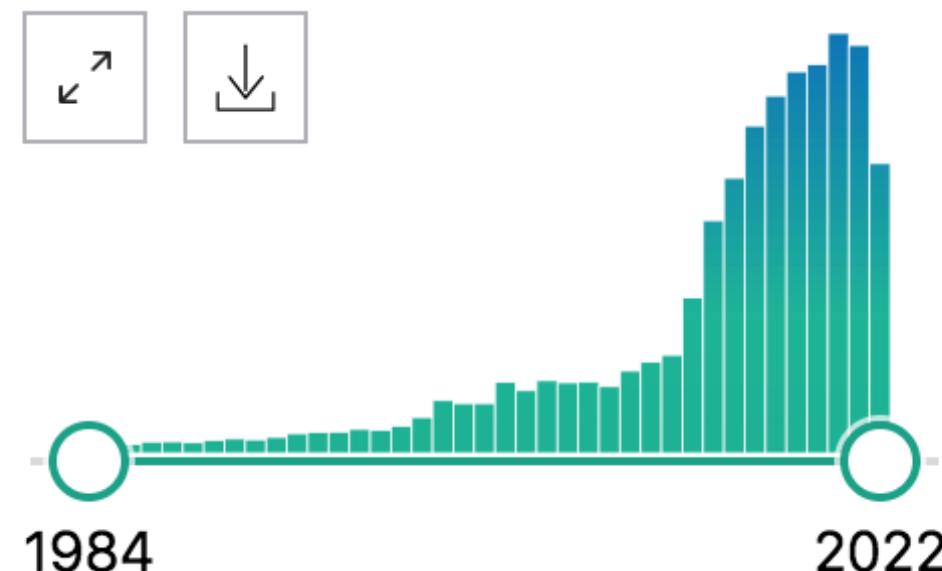
RESULTS BY YEAR



Près de 10 000 en 2022

« pharmacoepidemiology » dans Medline

RESULTS BY YEAR



Journal of the American Academy of Dermatology

Volume 78, Issue 4, April 2018, Pages 673-681.e9



Original article

Hydrochlorothiazide use and risk of nonmelanoma skin cancer: A nationwide case-control study from Denmark

Sidsel Arnsø Pedersen MD ^{a, b, c}, David Gaist PhD ^{a, b}, Sigrun Alba Johannesdottir Schmidt PhD ^d, Lisbet Rosenkrantz Hølmich DMSc ^e, Søren Friis MD ^{d, f, g}, Anton Pottegård PhD ^c

Journal of
Hypertension

Articles & Issues ▾ For Authors ▾ Journal Info ▾ Latest Articles Podcasts Twitter

EDITORIAL

:≡
Outline

🖼
Images

⬇
Download

〃
Cite

A reverse translational pharmacological approach to understand the underlying mechanisms of the reported association between hydrochlorothiazide and non-melanoma skin cancer

Bigagli, Elisabetta^a; Mugelli, Alessandro^a; Mancia, Giuseppe^b

Author Information

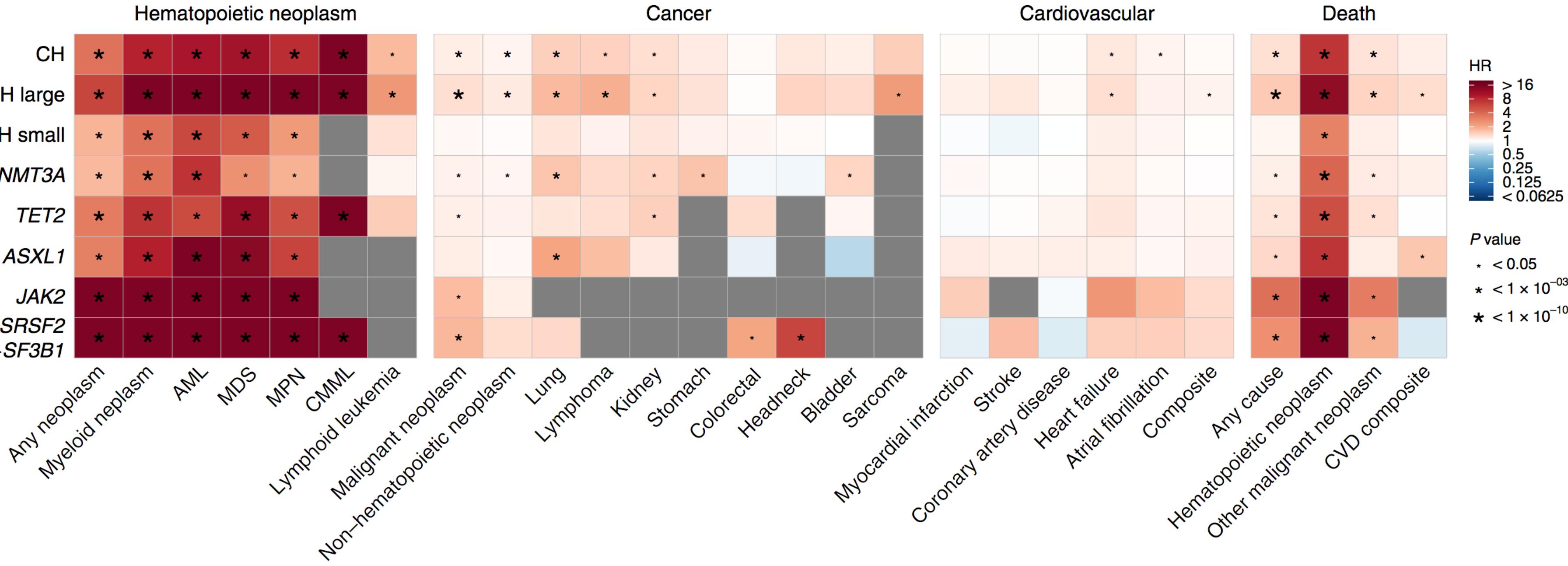
Journal of Hypertension: September 2022 - Volume 40 - Issue 9 - p 1647-1649
doi: 10.1097/JHJ.0000000000003167

OPEN

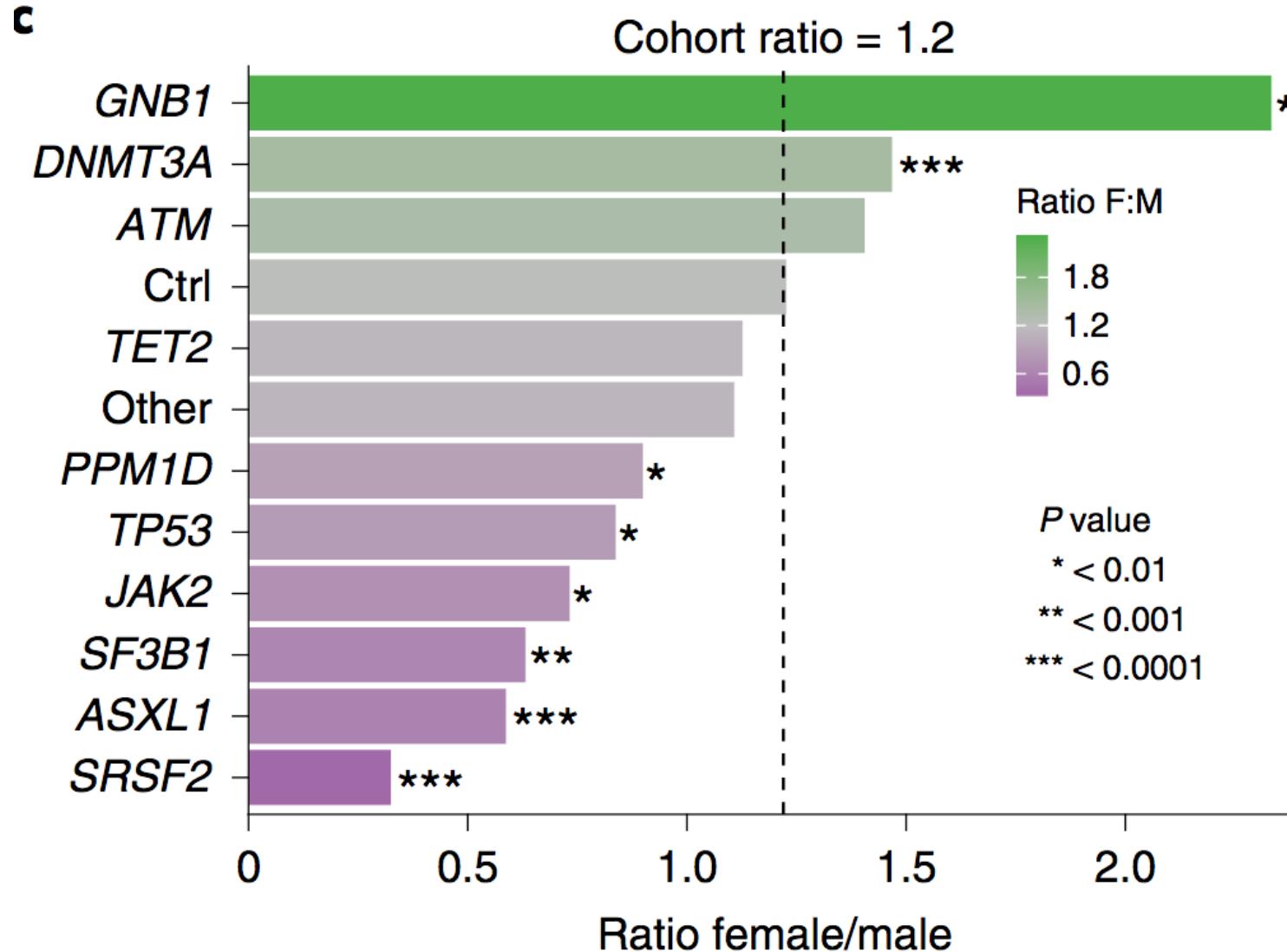
Genome-wide analyses of 200,453 individuals yield new insights into the causes and consequences of clonal hematopoiesis

Siddhartha P. Kar^{1,2,12}✉, Pedro M. Quiros^{3,4,5,12}✉, Muxin Gu^{3,4}, Tao Jiang⁶, Jonathan Mitchell⁷, Ryan Langdon^{1,2}, Vivek Iyer⁴, Clea Barcena^{3,4}, M. S. Vijayabaskar^{3,4}, Margarete A. Fabre^{3,4,8}, Paul Carter⁹, Slavé Petrovski^{7,10}, Stephen Burgess^{6,11} and George S. Vassiliou^{3,4,8}✉

b



c



- Le tabagisme et les télomères longs sont des facteurs de risque pour l'hématopoïèse clonale.
- La prédisposition génétique à CH est associée de manière causale à un risque élevé de syndrome myéloprolifératif
- Elle augmente aussi les risques de cancer du poumon, prostate, ovaire, oropharyngé et de l'endomètre
- Ces gènes sont des biomarqueurs de développement de cancer.

Cite as: P. Bastard *et al.*, *Science*
10.1126/science.abd4585 (2020).

Auto-antibodies against type I IFNs in patients with life-threatening COVID-19

Paul Bastard^{1,2,3*}†, Lindsey B. Rosen^{4†}, Qian Zhang^{3‡}, Eleftherios Michailidis^{5‡}, Hans-Heinrich Hoffmann^{5‡}, Yu Zhang^{4‡}, Karim Dorgham^{6‡}, Quentin Philippot^{1,2‡}, Jérémie Rosain^{1,2,3‡}, Vivien Béziat^{1,2,3‡}, Jérémie Manry^{1,2}, Elana Shaw⁴, Liis Haljasmägi⁷, Pärt Peterson⁷, Lazaro Lorenzo^{1,2}, Lucy Bizen^{1,2}, Sophie Trouillet-Assant^{8,9}, Kerry Dobbs⁴, Adriana Almeida de Jesus⁴, Alexandre Belot^{10,11,12}, Anne Kallaste¹³, Emilie Catherinot¹⁴, Yacine Tandjaoui-Lambotte¹⁵, Jeremie Le Pen⁵, Gaspard Kerner^{1,2}, Benedetta Bigio³, Yoann Seelleuthner^{1,2}, Rui Yang³, Alexandre Bolze¹⁶, András N. Spaan^{3,17}, Ottavia M. Delmonte⁴, Michael S. Abers⁴, Alessandro Aiuti¹⁸, Giorgio Casari¹⁸, Vito Lampasona¹⁸, Lorenzo Piemonti¹⁸, Fabio Ciceri¹⁸, Kaya Bilguvar¹⁹, Richard P. Lifton^{19,20,21}, Marc Vasse²², David M. Smadja²³, Mélanie Migaud^{1,2}, Jérôme Hadjadj²⁴, Benjamin Terrier²⁵, Darragh Duffy²⁶, Lluis Quintana-Murci^{27,28}, Diederik van de Beek²⁹, Lucie Roussel^{30,31}, Donald C. Vinh^{30,31}, Stuart G. Tangye^{32,33}, Filomeen Haerynck³⁴, David Dalmau³⁵, Javier Martinez-Picado^{36,37,38}, Petter Brodin^{39,40}, Michel C. Nussenzweig^{41,42}, Stéphanie Boisson-Dupuis^{1,2,3}, Carlos Rodríguez-Gallego^{43,44}, Guillaume Vogt⁴⁵, Trine H. Mogensen^{46,47}, Andrew J. Oler⁴⁸, Jingwen Gu⁴⁸, Peter D. Burbelo⁴⁹, Jeffrey Cohen⁵⁰, Andrea Biondi⁵¹, Laura Rachele Bettini⁵¹, Mariella D'Angio⁵¹, Paolo Bonfanti⁵², Patrick Rossignol⁵³, Julien Mayaux⁵⁴, Frédéric Rieux-Laucat²⁴, Eystein S. Husebye^{55,56,57}, Francesca Fusco⁵⁸, Matilde Valeria Ursini⁵⁸, Luisa Imberti⁵⁹, Alessandra Sottini⁵⁹, Simone Paghera⁵⁹, Eugenia Quiros-Roldan⁶⁰, Camillo Rossi⁶¹, Riccardo Castagnoli⁶², Daniela Montagna^{63,64}, Amelia Licari⁶², Gian Luigi Marseglia⁶², Xavier Duval^{65,66,67,68,69}, Jade Ghosn^{68,69}, HGID Lab§, NIAID-USUHS Immune Response to COVID Group§, COVID Clinicians§, COVID-STORM Clinicians§, Imagine COVID Group§, French COVID Cohort Study Group§, The Milieu Intérieur Consortium§, CoV-Contact Cohort§, Amsterdam UMC Covid-19 Biobank§, COVID Human Genetic Effort§, John S. Tsang^{70,71}, Raphaela Goldbach-Mansky⁴, Kai Kisand⁷, Michail S. Lionakis⁴, Anne Puel^{1,2,3}, Shen-Ying Zhang^{1,2,3}, Steven M. Holland^{4¶}, Guy Gorochov^{6,72¶}, Emmanuelle Jouanguy^{1,2,3¶}, Charles M. Rice^{5¶}, Aurélie Cobat^{1,2,3¶}, Luigi D. Notarangelo^{4¶}, Laurent Abel^{1,2,3¶}, Helen C. Su^{4#}, Jean-Laurent Casanova^{1,2,3,42,73*#}

Cite as: P. Bastard *et al.*, *Sci. Immunol.*
10.1126/sciimmunol.abl4340 (2021).

Autoantibodies neutralizing type I IFNs are present in ~4% of uninfected individuals over 70 years old and account for ~20% of COVID-19 deaths



The risk of COVID-19 death is much greater and age dependent with type I IFN autoantibodies

Paul Bastard^{1,2,3*}†, Lindsey B. Rosen^{4†}, Qian Zhang^{3‡}, Eleftherios Michailidis^{5‡}, Hans-Heinrich Hoffmann^{5‡}, Yu Zhang^{4‡}, Karim Dorgham^{6‡}, Quentin Philippot^{1,2‡}, Jérémie Rosain^{1,2,3‡}, Vivien Béziat^{1,2,3‡}, Jérémie Manry^{1,2}, Elana Shaw⁴, Liis Haljasmägi⁷, Pärt Peterson⁷, Lazaro Lorenzo^{1,2}, Lucy Bizen^{1,2}, Sophie Trouillet-Assant^{8,9}, Kerry Dobbs⁴, Adriana Almeida de Jesus⁴, Alexandre Belot^{10,11,12}, Anne Kallaste¹³, Emilie Catherinot¹⁴, Yacine Tandjaoui-Lambotte¹⁵, Jeremie Le Pen⁵, Gaspard Kerner^{1,2}, Benedetta Bigio³, Yoann Seelleuthner^{1,2}, Rui Yang³, Alexandre Bolze¹⁶, András N. Spaan^{3,17}, Ottavia M. Delmonte⁴, Michael S. Abers⁴, Alessandro Aiuti¹⁸, Giorgio Casari¹⁸, Vito Lampasona¹⁸, Lorenzo Piemonti¹⁸, Fabio Ciceri¹⁸, Kaya Bilguvar¹⁹, Richard P. Lifton^{19,20,21}, Marc Vasse²², David M. Smadja²³, Mélanie Migaud^{1,2}, Jérôme Hadjadj²⁴, Benjamin Terrier²⁵, Darragh Duffy²⁶, Lluis Quintana-Murci^{27,28}, Diederik van de Beek²⁹, Lucie Roussel^{30,31}, Donald C. Vinh^{30,31}, Stuart G. Tangye^{32,33}, Filomeen Haerynck³⁴, David Dalmau³⁵, Javier Martinez-Picado^{36,37,38}, Petter Brodin^{39,40}, Michel C. Nussenzweig^{41,42}, Stéphanie Boisson-Dupuis^{1,2,3}, Carlos Rodríguez-Gallego^{43,44}, Guillaume Vogt⁴⁵, Trine H. Mogensen^{46,47}, Andrew J. Oler⁴⁸, Jingwen Gu⁴⁸, Peter D. Burbelo⁴⁹, Jeffrey Cohen⁵⁰, Andrea Biondi⁵¹, Laura Rachele Bettini⁵¹, Mariella D'Angio⁵¹, Paolo Bonfanti⁵², Patrick Rossignol⁵³, Julien Mayaux⁵⁴, Frédéric Rieux-Laucat²⁴, Eystein S. Husebye^{55,56,57}, Francesca Fusco⁵⁸, Matilde Valeria Ursini⁵⁸, Luisa Imberti⁵⁹, Alessandra Sottini⁵⁹, Simone Paghera⁵⁹, Eugenia Quiros-Roldan⁶⁰, Camillo Rossi⁶¹, Riccardo Castagnoli⁶², Daniela Montagna^{63,64}, Amelia Licari⁶², Gian Luigi Marseglia⁶², Xavier Duval^{65,66,67,68,69}, Jade Ghosn^{68,69}, HGID Lab§, NIAID-USUHS Immune Response to COVID Group§, COVID Clinicians§, COVID-STORM Clinicians§, Imagine COVID Group§, French COVID Cohort Study Group§, The Milieu Intérieur Consortium§, CoV-Contact Cohort§, Amsterdam UMC Covid-19 Biobank§, COVID Human Genetic Effort§, John S. Tsang^{70,71}, Raphaela Goldbach-Mansky⁴, Kai Kisand⁷, Michail S. Lionakis⁴, Anne Puel^{1,2,3}, Shen-Ying Zhang^{1,2,3}, Steven M. Holland^{4¶}, Guy Gorochov^{6,72¶}, Emmanuelle Jouanguy^{1,2,3¶}, Charles M. Rice^{5¶}, Aurélie Cobat^{1,2,3¶}, Luigi D. Notarangelo^{4¶}, Laurent Abel^{1,2,3¶}, Helen C. Su^{4#}, Jean-Laurent Casanova^{1,2,3,42,73*#}

Données de recherche

Cohorte multi-centrique

Données de vie réelle (EFS)

Echantillons



Des données et des hommes

nature

Explore content ▾ About the journal ▾ Publish with us ▾ Subscribe

[nature](#) > [articles](#) > [article](#)

Article | [Published: 13 June 2018](#)

Targeted therapy in patients with PIK3CA-related overgrowth syndrome

Quitterie Venot, Thomas Blanc, Smail Hadj Rabia, Laureline Berteloot, Sophia Ladraa, Jean-Paul Duong, Estelle Blanc, Simon C. Johnson, Clément Hoguin, Olivia Boccaro, Sabine Sarnacki, Nathalie Boddaert, Stephanie Pannier, Frank Martinez, Sato Magassa, Junna Yamaguchi, Bertrand Knebelmann, Pierre Merville, Nicolas Grenier, Dominique Joly, Valérie Cormier-Daire, Caroline Michot, Christine Bole-Feysot, Arnaud Picard, ... Guillaume Canaud  + Show authors

[Nature](#) 558, 540–546 (2018) | [Cite this article](#)

CLOVES Syndrome (Congenital Lipomatous Overgrowth, Vascular Malformation, Epidermal Naevi)



Adalynn, a young Waterford resident with CLOVES syndrome.

PIK3CA

Paris : un nouveau comprimé pour traiter le syndrome de Cloves

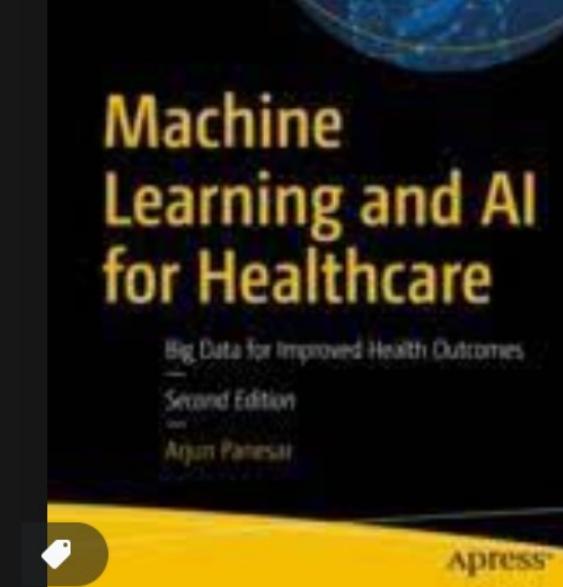
Un médecin de l'hôpital Necker de Paris a mis au point un nouveau protocole thérapeutique contre le syndrome de Cloves, une maladie génétique qui entraîne des déformations des organes. Avec un simple comprimé, le traitement montre, selon l'équipe médicale, des effets spectaculaires.

Publié le 14/06/2018 à 14h43 • Mis à jour le 12/06/2020 à 17h08

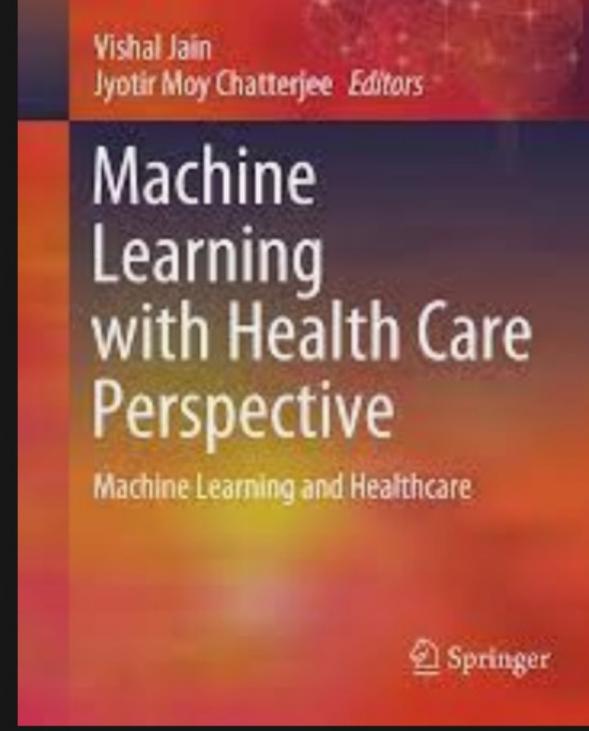


Le docteur Guillaume Canaud et Emmanuel, un patient traité pendant deux ans pour un syndrome de Cloves, à l'hôpital Necker de Paris. © Alain Jocard / AFP

La recherche technologique pour la médecine



Machine Learning and AI for Heal...
link.springer.com · In stock



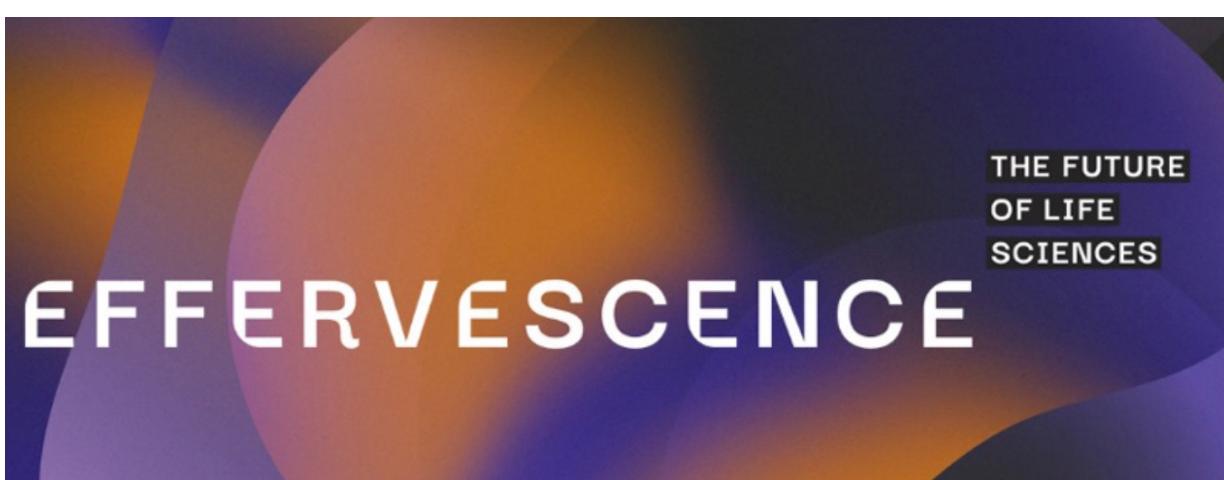
(PDF) Machine Learning with Heal...
researchgate.net



Artificial Intelligence and Machin...
link.springer.com · In stock



Artificial Intelligence in Healthcar...
routledge.com · In stock



EFFERVESCENCE

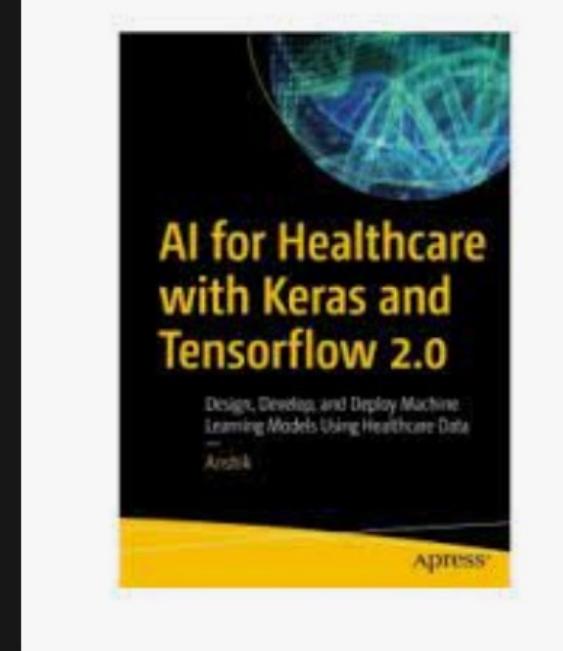
THE FUTURE
OF LIFE
SCIENCES



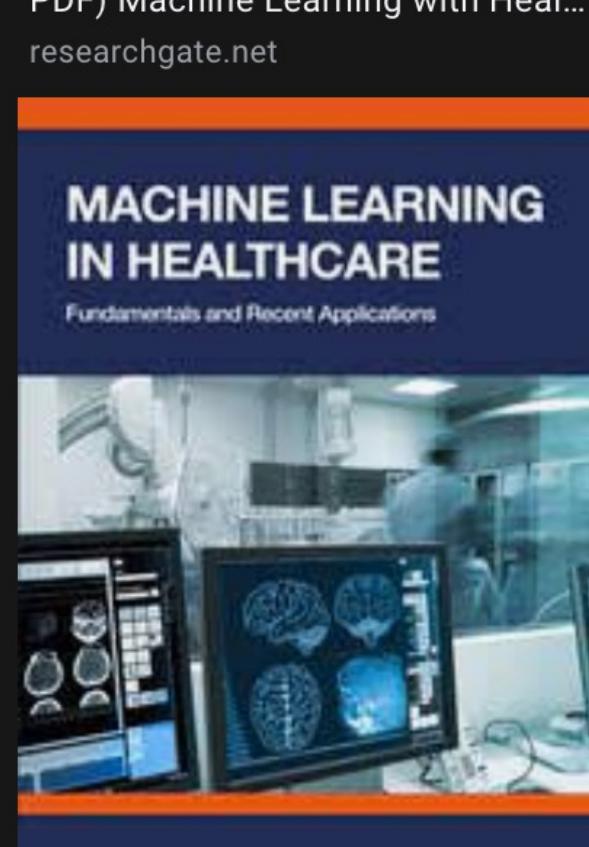
HEALTH
DATA HUB

European
Health Data
Space

#EHDS
#HealthUnion
#EUDigitalHealth



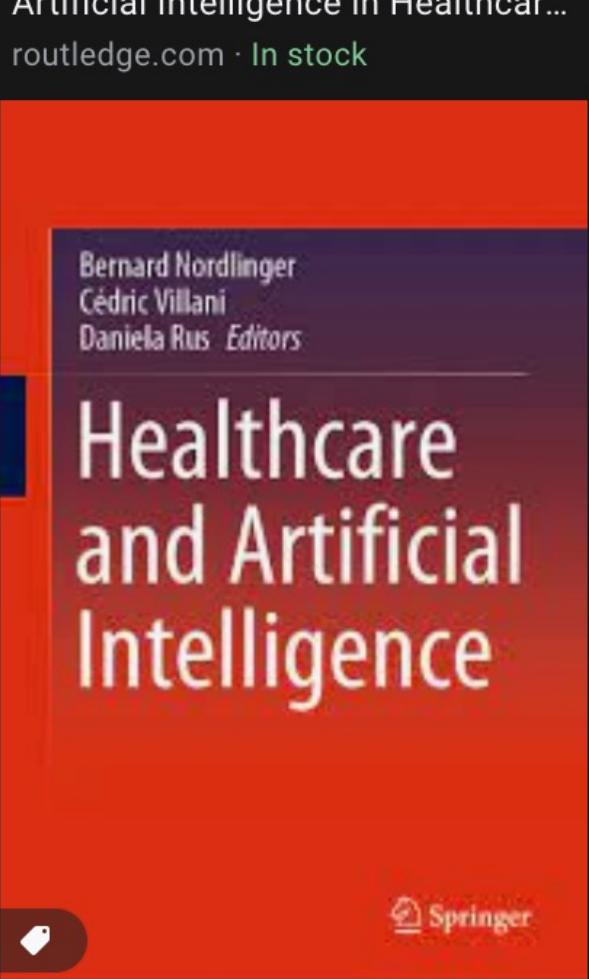
Machine Learning and AI for Heal...
itbook.store



Machine Learning and AI for Heal...
itbook.store



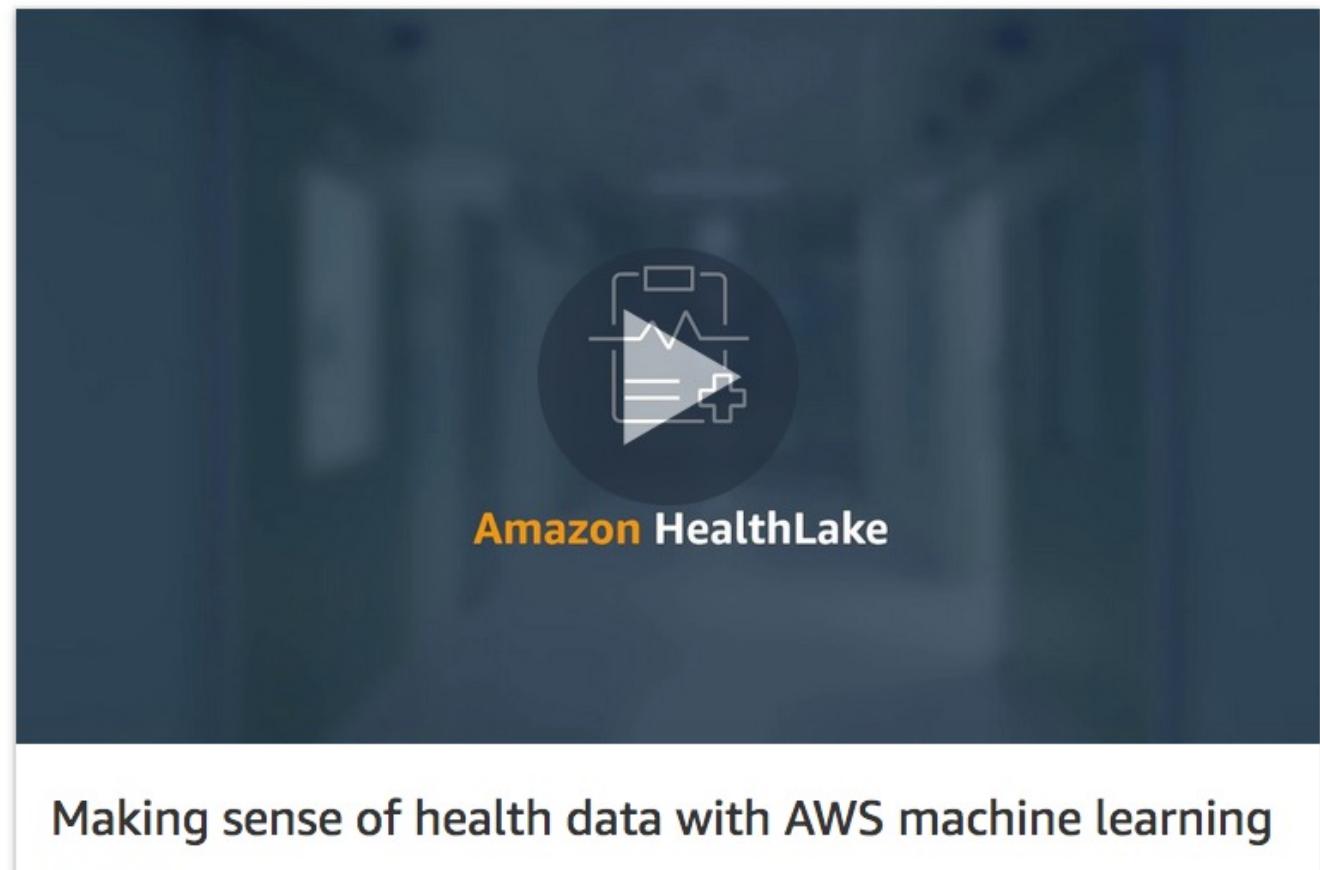
Machine Learning for Healthcare ...
itbook.store



Healthcare and Artificial Intellige...
link.springer.com · In stock



[dossier]
Données de santé
Utilisation, protection et valorisation



Making sense of health data with AWS machine learning
(3:19)



Réseau de recherche sur les données de santé du Canada
Health Data Research Network Canada

Consortium 4CE : prédition de la mortalité hospitalière à partir de RWD

Weber GM, et al International comparisons of laboratory values from the 4CE collaborative to predict COVID-19 mortality. NPJ Digit Med. 2022 Jun 13;5(1):74.

4 pays : France (Bordeaux et APHP) , Espagne, Allemagne, USA

284 hôpitaux et 40,000 patients

Modèle plus performant

Modèle avec 9 tests (CRP, créatinine, GB, lymphocytes, ASAT, ALAT, bilirubine totale, neutrophiles, albumine) **qui tient compte des RWD manquantes (seuil 30%) plus performant** que le modèle initial avec 17 variables

Modèle plus transportable

Portage vers site US : AUC max 0.842 si entrainé sur sites US et 0.847 si entrainé en Europe

Portage vers site français : AUC max 0,813 si entrainé aux USA vs. 0.791 si entrainé en Europe.

Effectifs du training set +++

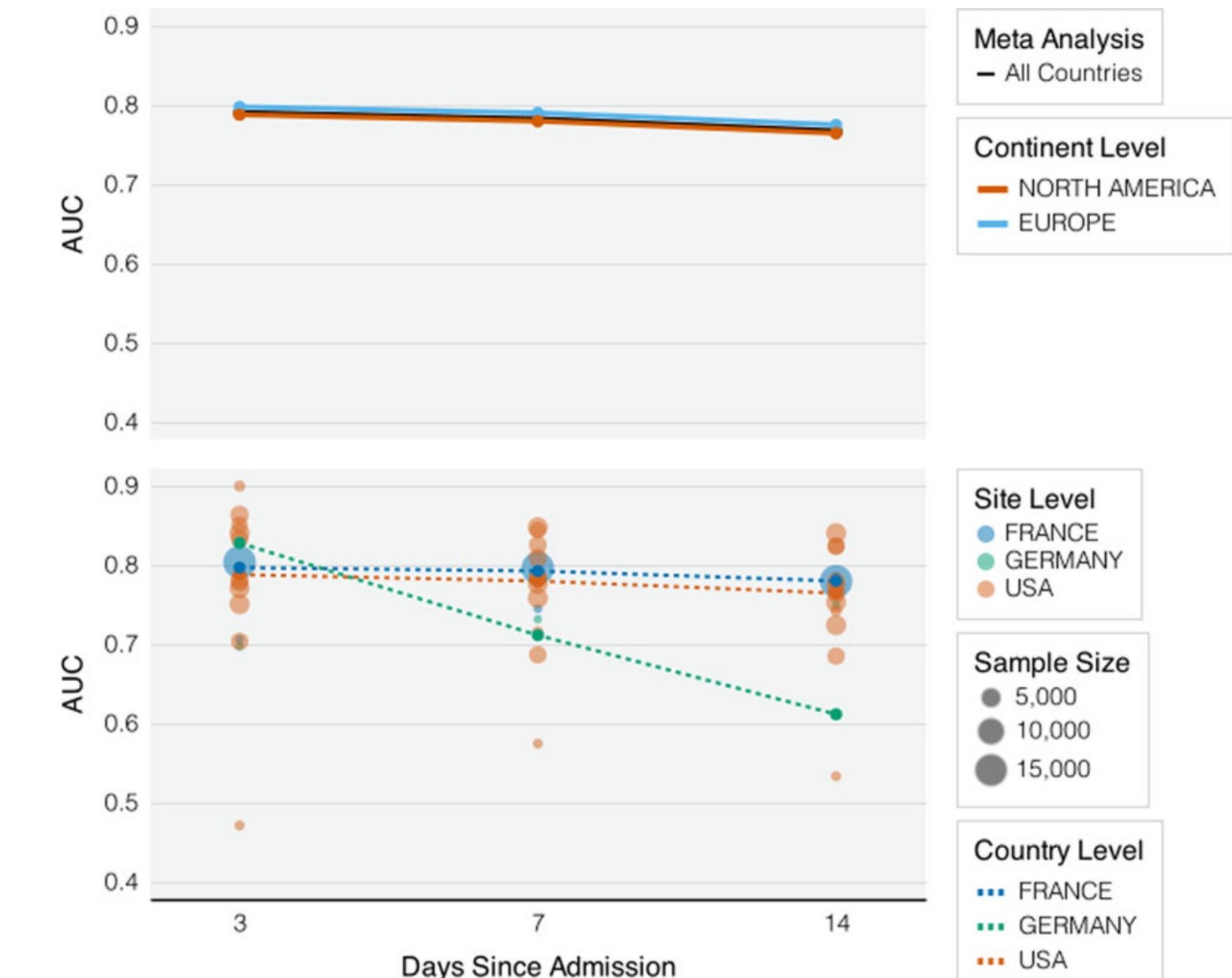
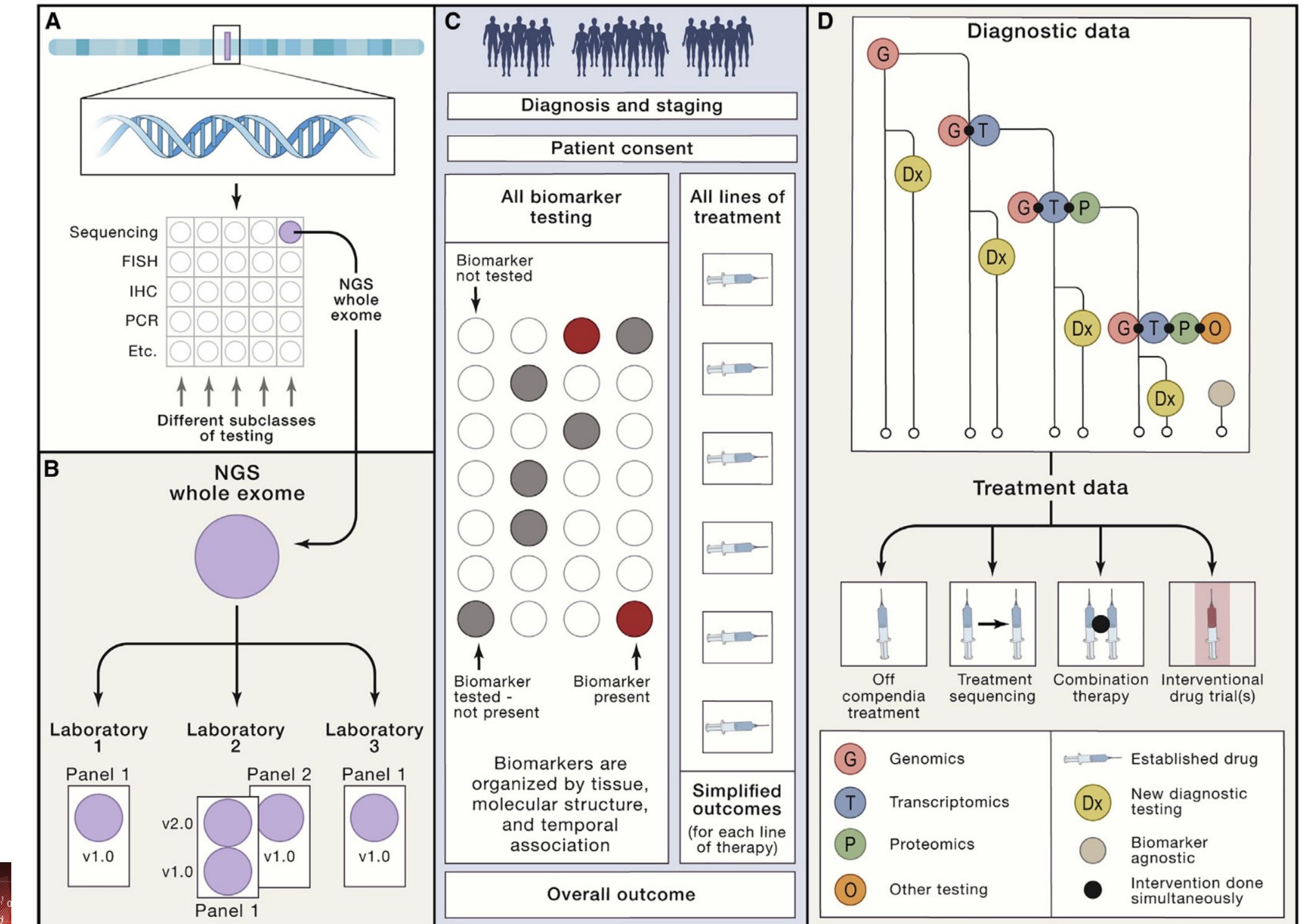


Fig. 2 Risk Model Performance Across Countries and Continents.
AUCs of cox regression models with nine common laboratory tests (missing rate <30%) in predicting death adjusting for demographic variables and Charlson comorbidity index.

Réunir recherche interventionnelle et RWD dans un Master Observational Trial

- Dickson D, Johnson J, Bergan R, Owens R, Subbiah V, Kurzrock R. **The Master Observational Trial: A New Class of Master Protocol to Advance Precision Medicine.** Cell. 2020 Jan 9;180(1):9-14.
- Jahn A, et al. Comprehensive cancer predisposition testing within the prospective MASTER trial **identifies hereditary cancer patients and supports treatment decisions for rare cancers.** Ann Oncol. 2022 Aug 18:S0923-7534(22)01859-2.
- Tsopra R, et al. **A framework for validating AI in precision medicine:** considerations from the European ITFoC consortium. BMC Med Inform Decis Mak. 2021 Oct 2;21(1):274.



Système apprenant Learning Health System

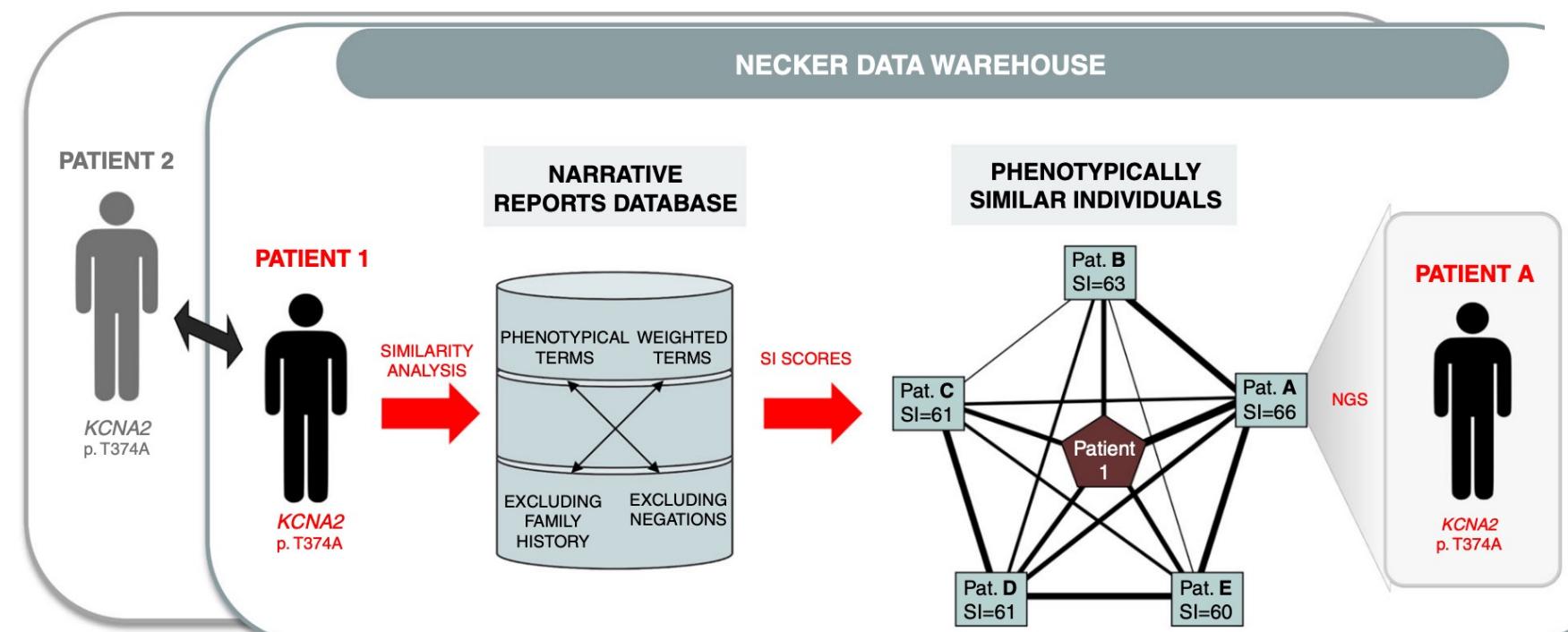
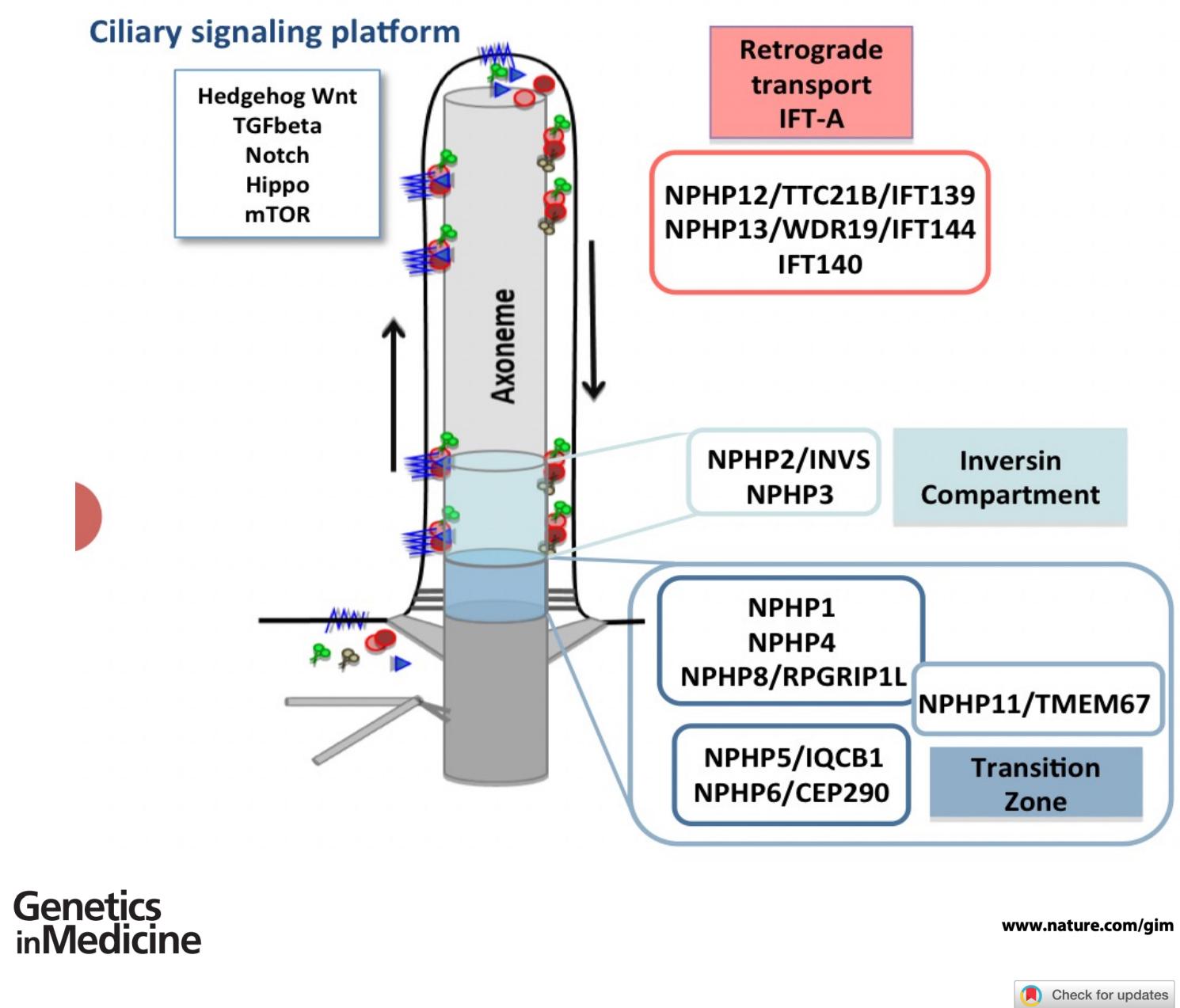
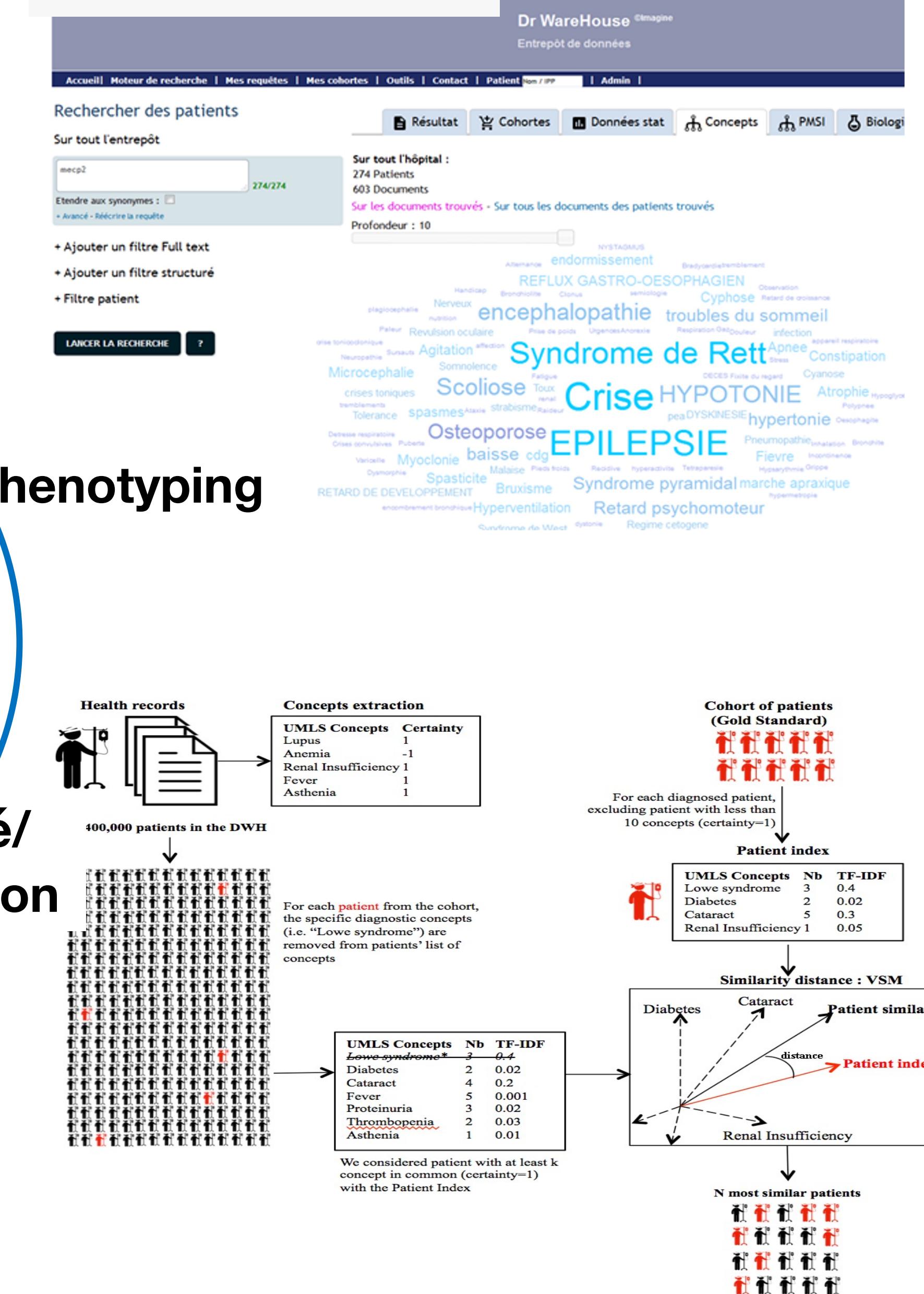
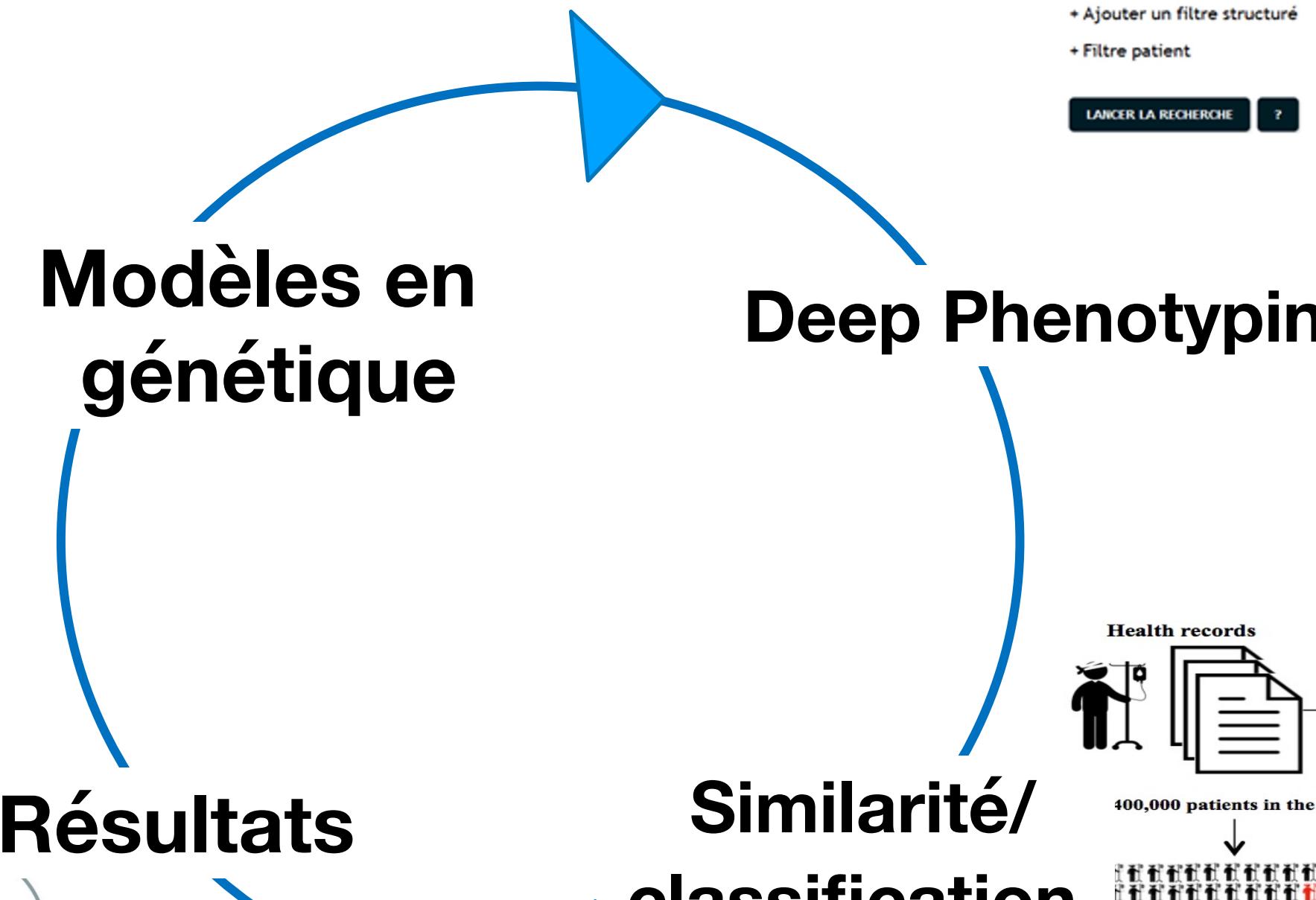


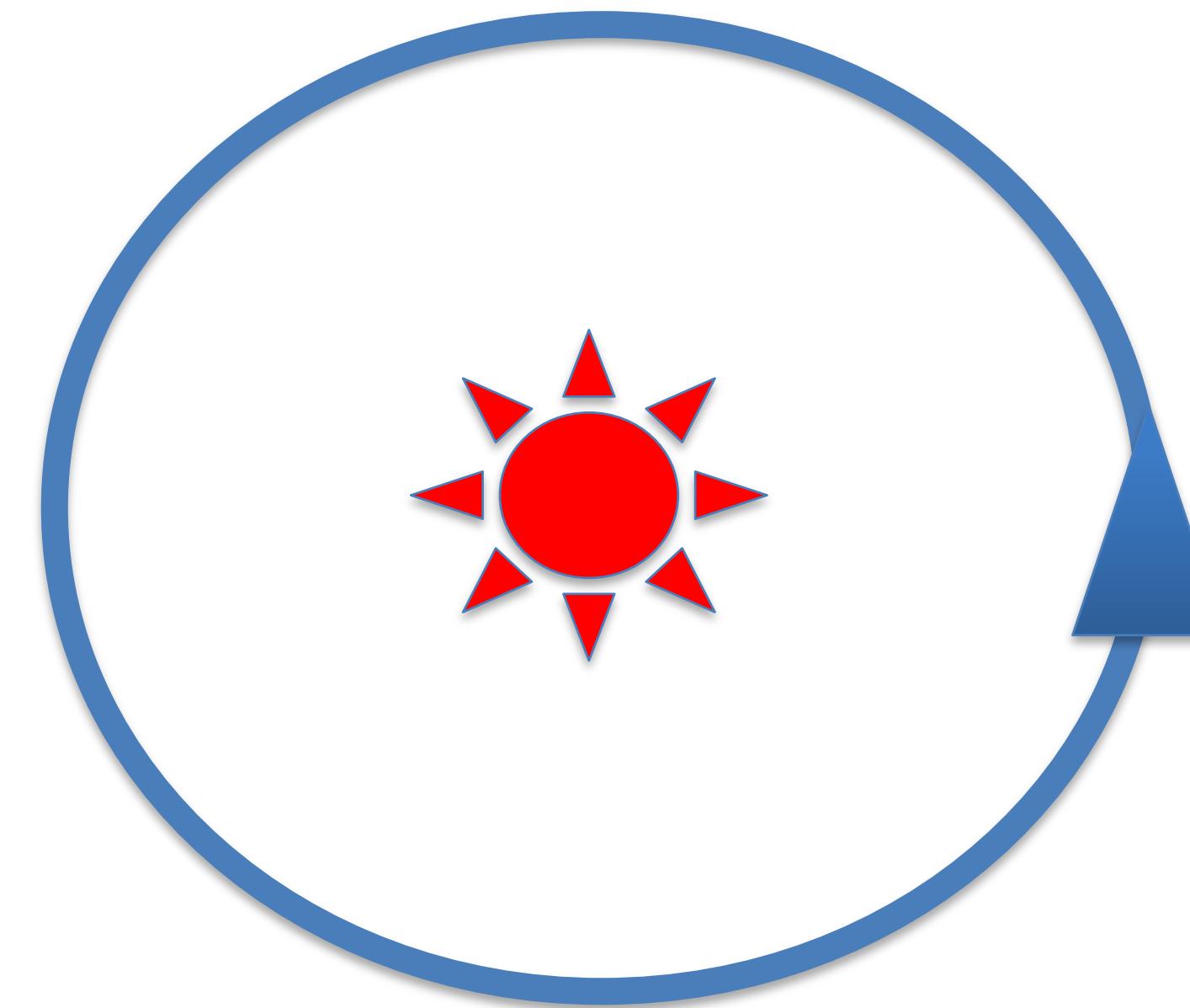
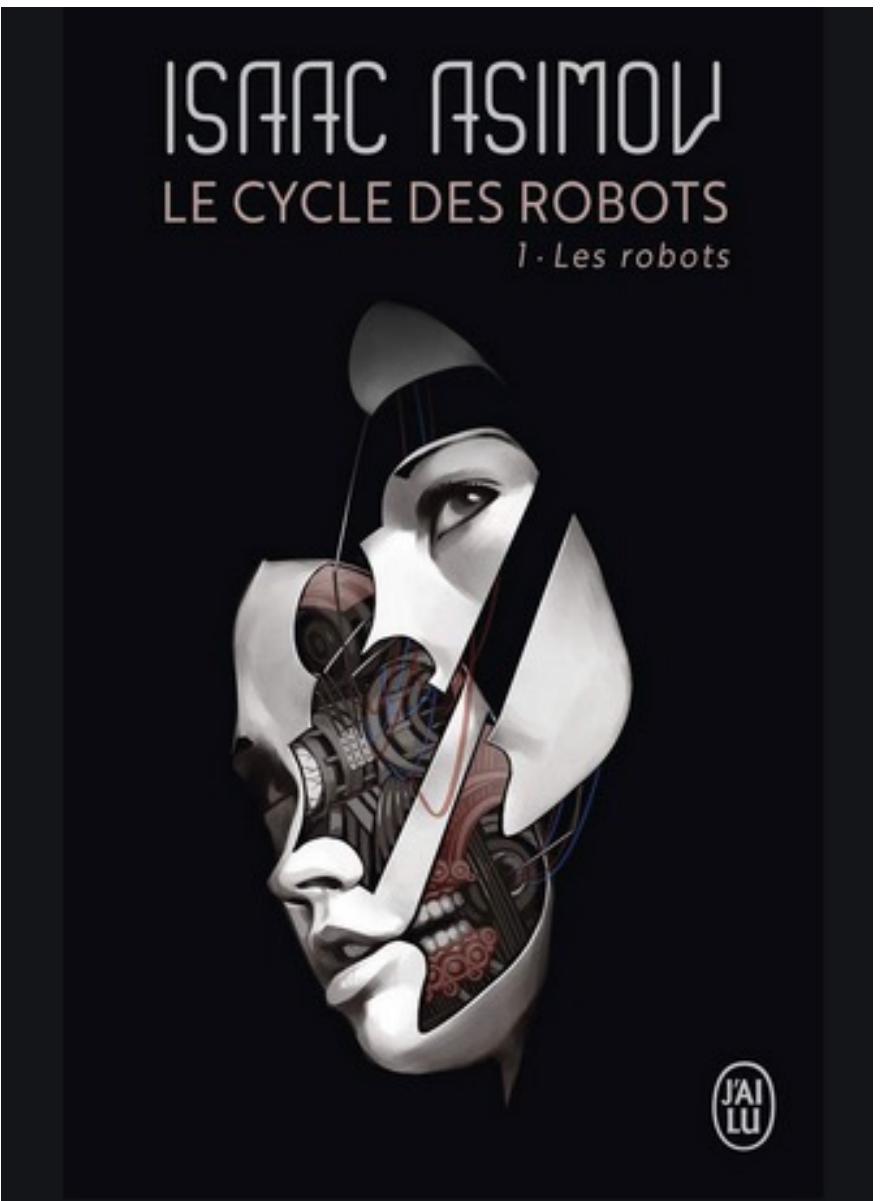
Fig. 1 Display of the two patients (patient 1 from our institution and patient 2 from another institution in our reference center network) sharing the same phenotype and the same *KCNA2* variant. Similarity analysis with all data warehouse narrative reports was performed, yielding a high similarity index (SI) in five patients (patients A–E). Exome sequencing validated that patient A, who had the highest SI, harbored the same *KCNA2* variant. NGS next-generation sequencing.





L'IA pour quelle décision au final ?

Steevie



Automated model versus treating physician for predicting survival time of patients with metastatic cancer

Gensheimer M. et al., Journal of the American Medical Informatics Association, , ocaa290, <https://doi.org/10.1093/jamia/ocaa290>

- Modèle de Machine Learning pour prédire la survie des patients atteints de cancer métastatique à partir des données du Dossier Patient Informatisé (Epic, Verona, WI) du Stanford Health Care system entre 2008–2020.
- laboratoire, signes vitaux, codes CIM, codes CPT, textes cliniques + radiologues, médicaments.
- Comparaison avec les prédictions de l'oncologue
- Le modèle prédit mieux que le clinicien.



**RESPONSIBL
E
INNOVATION**

Feature (+ means higher value increases survival)

-Pulse

-Age

+Ephedrine (medication)

+Complex radiation treatment delivery (CPT 77412)

+Office consultation (CPT 99244)

+Out of bed to chair (nursing order)

+Red blood cell count

+FDG PET/CT (skull to thighs)

-Red cell distribution width (lab)

+Weight

-Secondary malignant neoplasm of brain and spinal cord (ICD-9 198.3)

-Radiation treatment management (CPT 77427)

-Stereotactic MRI

-DNR/DNI order

-Encounter for palliative care (ICD-9 V66.7)

-Consult to palliative care

-Neoplasm-related pain (ICD-9 338.3)

-MRI full spine with and without contrast

Temporalité des données

An Eating Disorder Chatbot Is Suspended for Giving Harmful Advice

A nonprofit that helps people with body image problems closed its human-run helpline. The chatbot that remained suggested things like losing weight.

CLINICAL INFORMATICS & ANALYTICS

The National Eating Disorders Association has removed an artificial intelligence chatbot called Tessa from its helpline after the bot **dispensed advice that specialists said could have been detrimental to people with eating disorders**. The CEO of the company that developed Tessa said it had been programmed with guardrails and disclaimers and deviated from guidelines only 0.1% of the time, and the psychologist who helped create Tessa said it wasn't designed to be a standalone helpline replacement.

RESEARCH ARTICLE



Dissecting racial bias in an algorithm used to manage the health of populations

ZIAD OBERMEYER , BRIAN POWERS, CHRISTINE VOGELI, AND SENDHIL MULLAINATHAN [Authors Info & Affiliations](#)

SCIENCE • 25 Oct 2019 • Vol 366, Issue 6464 • pp. 447-453 • DOI: 10.1126/science.aax2342

39,119 1,258



- The U.S. health care system uses commercial algorithms to guide health decisions.
- An algorithm that used **historical health care spending as a proxy for illness severity to predict an individual's future health needs** and establish their eligibility for additional services.

POLICY & VALUE-BASED CARE > HEALTH EQUITY

New AMA President Ehrenfeld Stresses Health Equity Mission

AMA House of Delegates adopts policy calling for greater regulatory oversight of insurers' use of AI in reviewing patient claims and prior authorization requests

David Raths

June 14, 2023



Prospective, multi-site study of patient outcomes after implementation of the TREWS machine learning-based early warning system for sepsis

Roy Adams^{1,2}, Katharine E. Henry^{ID 2,3}, Anirudh Sridharan⁴, Hossein Soleimani⁵, Andong Zhan^{2,3}, Nishi Rawat⁶, Lauren Johnson⁷, David N. Hager⁸, Sara E. Cosgrove⁸, Andrew Markowski⁹, Eili Y. Klein^{ID 10}, Edward S. Chen⁸, Mustapha O. Saheed¹⁰, Maureen Henley⁷, Sheila Miranda¹¹, Katrina Houston⁷, Robert C. Linton⁴, Anushree R. Ahluwalia⁷, Albert W. Wu^{ID 6,8,12,13,14 ✉} and Suchi Saria^{ID 1,3,8,12,15 ✉}

Etude multicentrique sur 5 hôpitaux

Alerte sepsis :
Targeted Real-time Early Warning System (TREWS).



DAY ZERO
MEET THE FOUNDERS

"You need to understand the complex healthcare ecosystem to ensure you're solving the right problems. Problems that are not worth solving are not useful problems."

Suchi Saria, Ph.D.
Founder and CEO, Bayesian Health

590,736 patients monitorés avec TREWS (connexion au DPI).

**Aux urgences ou hospitalisés.
6,877 patients avec sepsis identifiés par alerte avant ATB.**

**Diminution de la mortalité absolue : 3.3%, [1.7, 5.1%]
Réduction des défaillances d'organe
Réduction des durées de séjour
Bénéfices supérieurs pour les patients graves**

**Identifier les patients plus tôt
Améliorer le pronostic**

RESEARCH ARTICLE

Open Access



Automation bias in electronic prescribing

David Lyell^{1*} ID, Farah Magrabi¹, Magdalena Z. Raban², L.G. Pont², Melissa T. Baysari^{2,3}, Richard O. Day⁴
and Enrico Coiera¹

Quand le CDSS est correct

REDUIT LES ERREURS DE 58,8%

Quand le CDSS se trompe

AUGMENTE LES ERREURS DE 86,6%

Confiance dans le CDSS?

CDSS qui font moins d'erreurs

Supervision par les humains

anita.burgun@aphp.fr

