



Advancing Precision Health through Domestic, Regional, and Global Collaboration and Partnerships

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Research Development and Innovation Advisor to the Chairperson of and Qatar Foundation and Executive Director of RDI at CPO

February 2,
2025



Acknowledgement



*The National
Academies of*

SCIENCES
ENGINEERING
MEDICINE

Advancing **Precision Health** through Domestic, Regional, and Global **Collaboration and Partnerships**

Outline

- **Milestones in Precision Health:** Where We Started and Where We Are - Qatar
- **Driving Precision Health Forward** Through National Synergies & Collaborations
- **The Case for Competitive Collaborations in the MENA region**
- **Rethinking Global Collaborations:** Towards New Models Rooted in Co-Creation and Shared Innovation
- **The Road Ahead:** Embracing Emerging Opportunities in Precision Health



Hital Lashuel, February 2nd, 2025, KFAS/NAMSE

Skyscrapers Rise in the Desert, But Can Science and R&D Thrive?

ABSOLUTELY

Qatar: Building and RDI Ecosystem from the Ground Up?



QATAR DAY
اليوم قطر



2020



QATAR FOUNDATION

AN ECOSYSTEM BUILT FOR IMPACT

**For Education, Science, and
Community Development**

Qatar Foundation is not a foundation, it is not a university, it is not a campus, it is a comprehensive ecosystem focusing on unlocking human potential . Built to be an engine of innovation and laboratory for Qatar and the world.



**Our journey
started with
one school**



**أكاديمية قطر
Qatar Academy**

Established in
1996

of Graduates
1,671

Our ecosystem has evolved to 13 mainstream and specialized schools



Established in
1996
of Graduates
428

Established in
2001
of Graduates
3,815

Established in
2005
of Graduates
308

Established in
2008
of Graduates
180

Established in
2011
of Graduates
120

Established in
2011
of Graduates
120



Established in
2012
of Graduates
101

Established in
2014
of Graduates
101

Established in
2016
of Graduates
47

Established in
2018
of Graduates
47

Established in
2019
of Graduates
47

Joined QF in
2019
of Graduates
47



7 Leading International Universities

vcuarts
QATAR


**Weill Cornell
Medicine-Qatar**

ATM
TEXAS A&M
UNIVERSITY at QATAR

**Carnegie
Mellon
University
Qatar**


جامعة جورجتاون قطر
GEORGETOWN UNIVERSITY QATAR

Northwestern | QATAR

HEC
PARIS
IN QATAR | فني قطر

Established in

1998

Alumni

1,109

Established in

2001

Alumni

588

Established in

2003

Alumni

1,628

Established in

2004

of Graduates

1,274

Established in

2005

of Graduates

937

Established in

2008

of Graduates

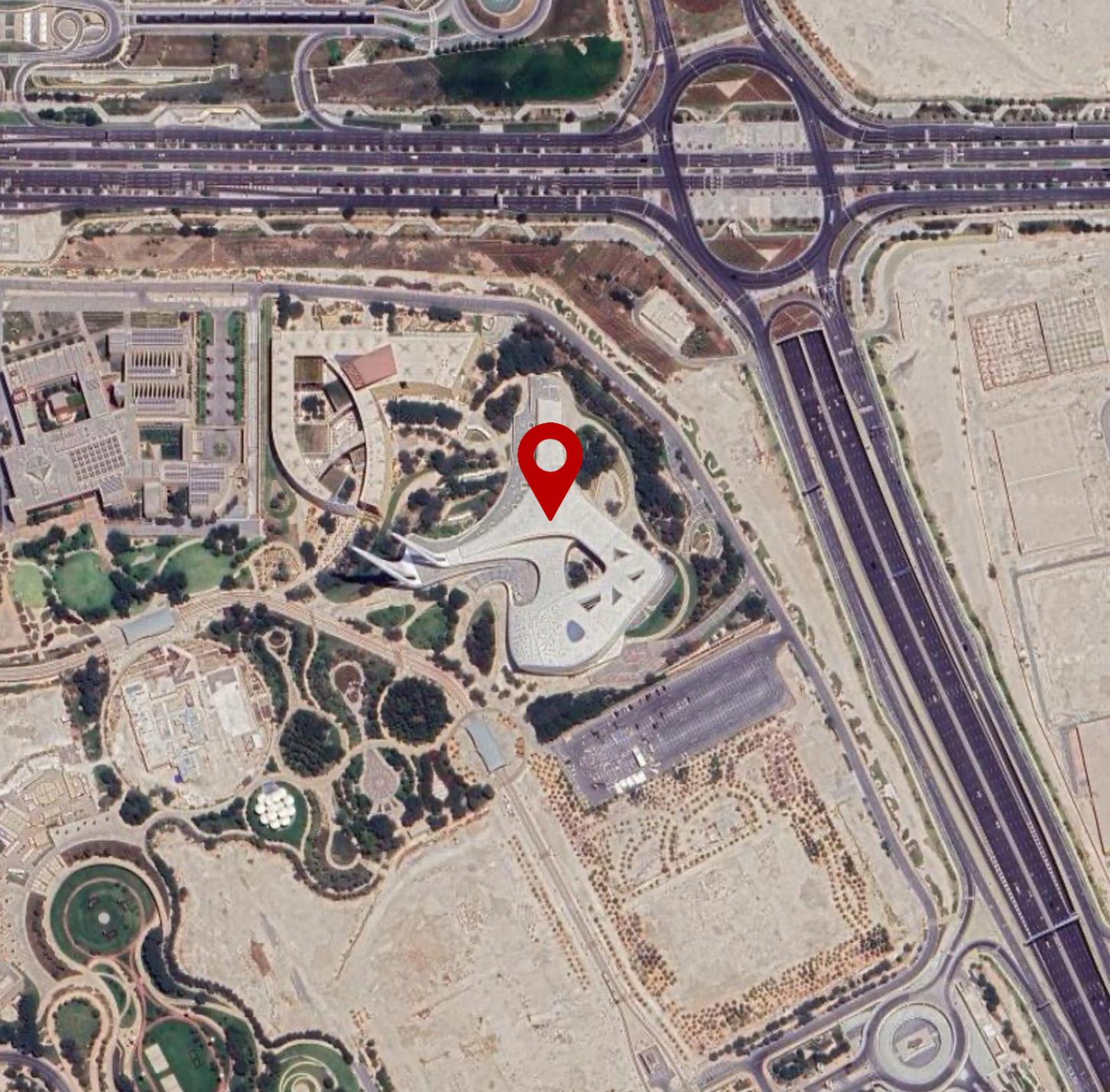
842

Established in

2010

of Graduates

842



1 Homegrown University



Established in

2010

Alumni

2,093

Colleges

- College of Health and Life Sciences
- College of Humanities and Social Sciences
- College of Islamic Studies
- College of Law
- College of Public Policy
- College of Science and Engineering

Education City: a unique multiversity model





Our research ecosystem


 وحدة قطر للمعلوم
 والتكنولوجيا
 QATAR SCIENCE & TECHNOLOGY PARK


 QCRI
 معهد قطر لبحوث الحوسبة
 Qatar Computing Research Institute
 جامعة حمد بن خليفة
 HAMAD BIN KHALIFA UNIVERSITY


 QEERI
 معهد قطر لبحوث البيئة والطاقة
 Qatar Environment & Energy Research Institute
 جامعة حمد بن خليفة
 HAMAD BIN KHALIFA UNIVERSITY


 QBRI
 معهد قطر لبحوث الطب الحيوي
 Qatar Biomedical Research Institute
 جامعة حمد بن خليفة
 HAMAD BIN KHALIFA UNIVERSITY


 سدرة للطب
 Sidra Medicine


 QPRI
 معهد قطر للرعاية الصحية الدقيقة
 Qatar Precision Health Institute
 عضو في مؤسسة قطر
 Member of Qatar Foundation

Established in
2004

Established in
2009

Established in
2009

Established in
2009

Established in
2018

Established in
2024

Our Policy/Think Tanks Hub



Established in
2006

UN-affiliated advocate
for family policy



Established in
2009

Global education
thinktank



Established in
2013

Global healthcare
initiative and Platform



Established in
2022

Sustainability policy,
research, and
advocacy hub





أكاديمية قطر
Qatar Academy

أكاديمية الخور
Al Khor
Qatar Academy

أكاديمية الوكرة
Al Wakra
Qatar Academy

أكاديمية السدرة
Sidra
Qatar Academy

أكاديمية مشيرب
Msheireb
Qatar Academy

Northwestern | QATAR

العوسج
awsaj
أكاديمية العوسج
AWSAJ ACADEMY

ABP
برنامج الجسر الأكاديمي
Academic Bridge Program

أكاديمية قطر للقيادة
Qatar Leadership Academy

أكاديميتي
ACADEMYATI



جامعة جورجيتاون قطر
GEORGETOWN UNIVERSITY QATAR

أكاديمية قطر
للعلوم والتكنولوجيا
QATAR ACADEMY FOR
SCIENCE & TECHNOLOGY

أكاديمية قطر للموسيقى
Qatar Music Academy

جامعة
حمد بن خليفة
HAMAD BIN KHALIFA
UNIVERSITY

Carnegie
Mellon
University
Qatar

ATM
TEXAS A&M
UNIVERSITY at QATAR

HEC
PARIS
في قطر | IN QATAR

vcuarts
QATAR

إرثنا
earthna

Weill Cornell
Medicine-Qatar
Ansar Gallery
- Al Rayyan
Hypermarket

مؤتمر القمة العالمي للابتكار في الرعاية الصحية
World Innovation Summit for Health

وايز
wise

DIFI
معهد الدوحة الدولي للأسرة
Doha International Family Institute

QP
معهد قطر للرعاية الصحية الدقيقة
Qatar Precision Health Institute
عضو في مؤسسة قطر
Member of Qatar Foundation

سدرة للطب
Sidra Medicine

وحدة قطر للمعلوم
والتكنولوجيا
QATAR SCIENCE & TECHNOLOGY PARK

QEERI
معهد قطر لبحوث البيئة والطاقة
Qatar Environment & Energy Research Institute
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

QCRI
معهد قطر لبحوث الحوسبة
Qatar Computing Research Institute
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

QBRI
معهد قطر لبحوث الطب الحيوي
Qatar Biomedical Research Institute
جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY

SOCIAL IMPACT

Centers established by QF have grown, matured, and ultimately become independent, as they continue to serve the people of Qatar and beyond:

- Qatar National Library
- Social Development Center
- Reach Out To Asia
- Qatar Career Development Center
- Qatar Diabetes Association
- Qatar Debate
- Qatar Philharmonic Orchestra
- **Qatar National Research Fund**
- **Qatar Research, Development, and Innovation**

NATIONAL IMPACT

QF has laid the foundations for:

- Qatar's national research strategy
- Qatar's national AI strategy
- Qatar's overarching RDI governance

And its establishment of Qatar National Research Fund has enabled:

\$1.5bn

to be
committed
to research

5,900

research
projects to
be funded

1,100

research
collaborations
to be formed in
67 countries

Qatar University: 18 Research Centers

Research Centers (Under VPRGS)

1. Center for Advanced Materials (CAM)
2. Environmental Studies Center (ESC)
3. Central Laboratories Unit (CLU)
4. Laboratory Animal Research Center (LARC) ←
5. Biomedical Research Center (BRC)
6. Social and Economic Survey Research Institute (SESRI)
7. Ibn Khaldoun Center for Humanities & Social Sciences
8. Qatar University – Young Scientists Center (QU-YSC)
9. Agricultural Research Station (ARS)

Research Centers (Under CAS)

10. Center for Sustainable Development (CSD)
11. Gulf Studies Center (GSC)

Research Centers (Under CENG)

12. Kindi Lab for Computing Research (KINDI)
13. Qatar Transportation and Traffic Safety Center (QTTSC)
14. Gas Processing Center (GPC)

Research Centers (Under CBE)

15. Center for Entrepreneurship (CFE)

Research Centers (Under LAWC)

16. Centre for Law & Development (CLD)

Research Centers (Under CEDU)

17. Educational Research Center (ERC)
18. National Center for Educational Development (NCED)

QU Health Since 2017

College of
Nursing
2022

College of
Dental Medicine
2020

College of
Health Sciences
2016

College of
Medicine
2014

College of
Pharmacy
2007

Years of establishment



- 2007** College of Pharmacy
500+ Alumni
- 2014** College of Medicine
150 Alumni
- 2016** College of Health Sciences
980+ Alumni
- 2018** College of Dental Medicine
First batch expected to graduate in 2025
- 2022** College of Nursing
First batch expected to graduate in 2026

Programs



740+ Publications



120 by Graduate Students

Average Impact Factor

6.6



81% in Q1 and Q2 in international journals

23 Among Global Top 2% highly cited researchers in 2023
QU Health Faculty

Who we are?



Undergraduate 1580+ Graduate 200+ Students



225+ Admin and Academic staff

160+ Faculty



350+ Clinical Affiliates

Faculty and Staff Statistics



Accreditations

- 2024-2030** College of Medicine
Full 6-year accreditation by **TEPDAD**
- 2014-2028** Doctor of Pharmacy
First international program to be awarded full **CCAPP**
- 2012-2028** BSc Pharmacy
First international program to be awarded full **CCAPP**
- 2006-2030** BSc Biomedical Sciences
Full academic accreditation by **NAACLS**
- 2017-2025** BSc Human Nutrition
Full academic accreditation by **ACEND**

Funding \$25 M

Earned in research funding between 2021 and 2024

Strategic Partnerships

National

30

Regional

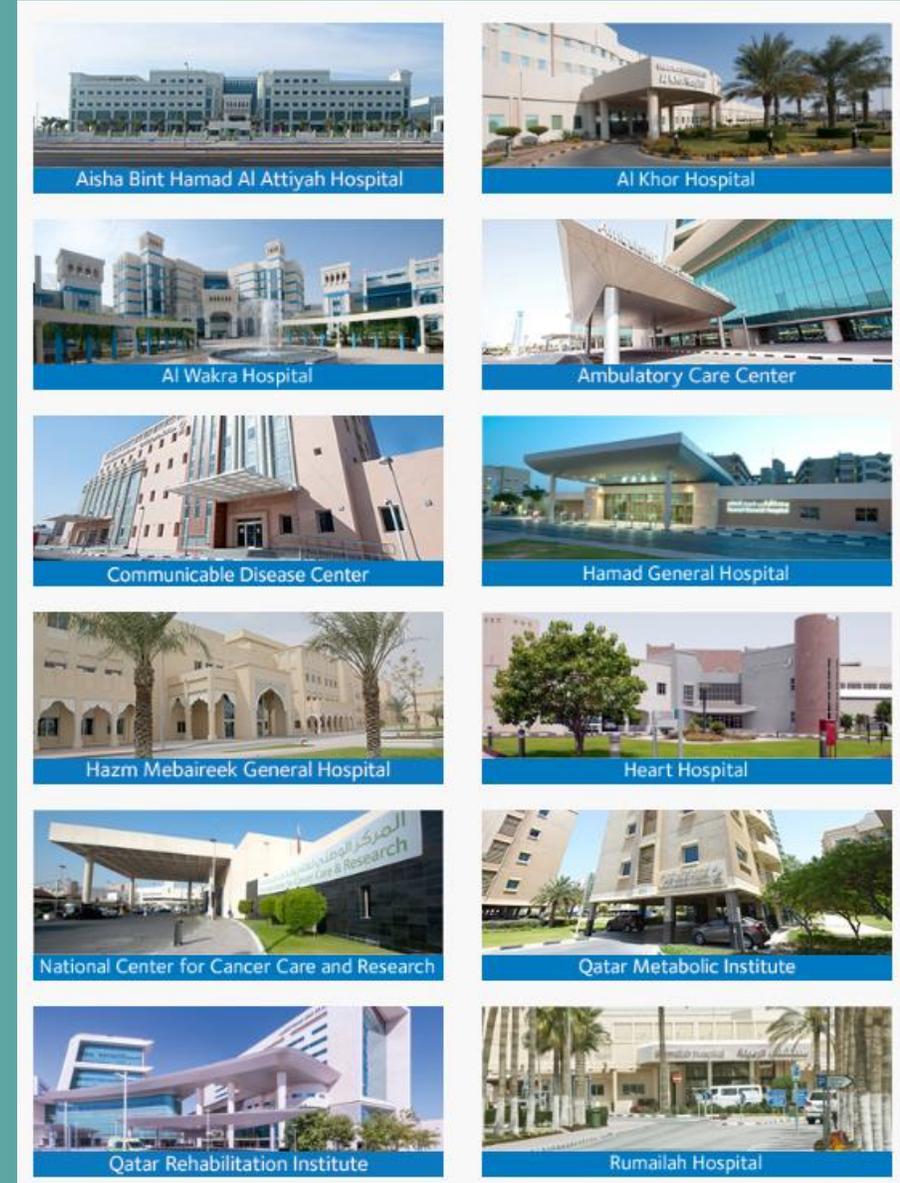
24

International

56

Hamad Medical Corporation - Hospitals

- 1957: Rumailah Hospital
- 1982: Hamad General Hospital
- 1988: Women's Hospital
- 2004: National Center for Cancer Care & Research
- 2005: Al Khor Hospital
- 2011: Heart Hospital
- 2012: The Cuban Hospital
- 2012: Al Wakra Hospital
- 2016: Communicable Diseases Center
- 2017: Qatar Rehabilitation Institute
- 2017: Ambulatory care Center
- 2017: Women's Wellness & Research Center
- 2018: Hazm Mebareek General Hospital
- 2020: Mesaieed Hospital
- 2020: Ras Laffan Hospital
- 2022: Aisha Bint Hamad Al Attiyah Hospital





Mission

- To contribute to the advancement of medical knowledge to significantly benefit the health and wellbeing of people living in Qatar.

المركز الوطني لعلاج وأبحاث السرطان
National Center for Cancer Care & Research

عضو في مؤسسة حمد الطبية
A Member of Hamad Medical Corporation



A new Clinical Trial Unit

Vision

- To become a local, regional and international premier center of excellence in designing, delivering, and implementing collaborative and innovative clinical trials.



استراتيجية قطر للبحوث والتطوير والابتكار 2030

خارطة الطريق نحو بناء اقتصاد المعرفة على النحو المستهدف في رؤية قطر الوطنية 2030



استراتيجية قطر للبحوث والتطوير
والابتكار 2030



إنشاء مجلس قطر للبحوث
والتطوير والابتكار



استراتيجية التنمية الوطنية
National Development Strategy

استراتيجية التنمية الوطنية الثالثة
2004-2030



رؤية قطر الوطنية 2030



Home Resources Programs

Innovation
Alchemist Doha
Knowledge Transfer Partnership Qatar (KTP-Q)
Industry Innovation Challenge (IIC)
Technology Development Grant (TDG)
Qatar Open Innovation (QOI)
Qatar Spain Innovation Program (QASIP)

Capability Building Program
Corporate Innovation Leaders
Product Management for SMEs
Government Innovation Leaders Program
Technology Innovation Training Program
Conference and Workshop Sponsorship Program (CWSP)

Scientific Research
Academic Research Grant (ARG)
Academia-Industry Cooperation Call (AICC)
Climate Change and Environment Call (CCEC)
Economic Sustainability Call (ESC)
Food Security Call (FSC)
Modernizing Charitable Sector Call (MCSC)
Path Towards Precision Medicine (PPM)
Pathways Toward Prosperity (PTP)

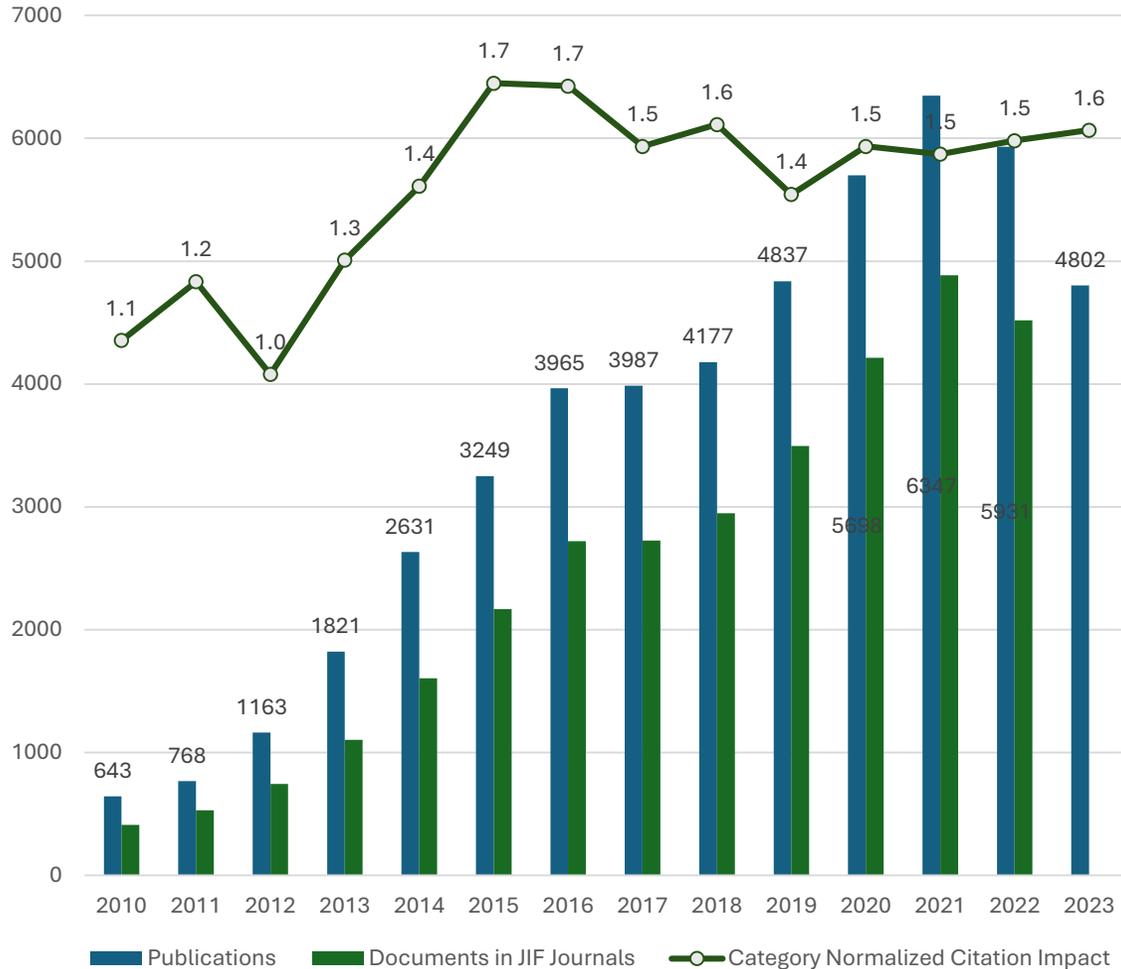
Talent Development
Displaced Arab Researcher (DAR)
Graduate Student Research Award (GSRA)
Undergraduate Research Experience Program (UREP)
Highschool Research Experience Program (HSREP)

Grant Funding in Precision Medicine: \$100 Million

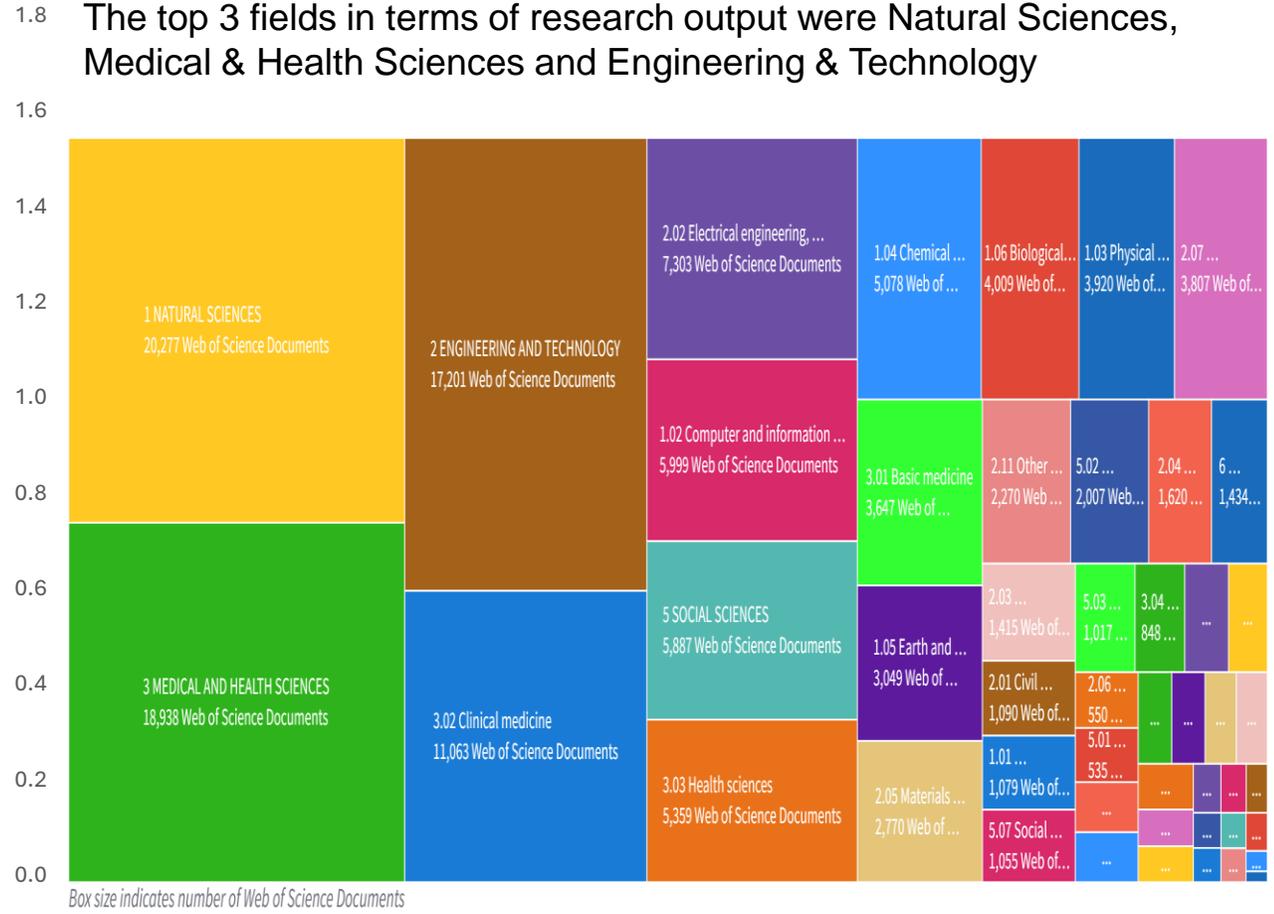
Path to Precision Medicine Program: \$30 M

Over the years, Qatar's R&D workforce and research productivity has shown growth in both the quantity and quality of their scientific outputs

Qatar publications 2010-2023



The top 3 fields in terms of research output were Natural Sciences, Medical & Health Sciences and Engineering & Technology

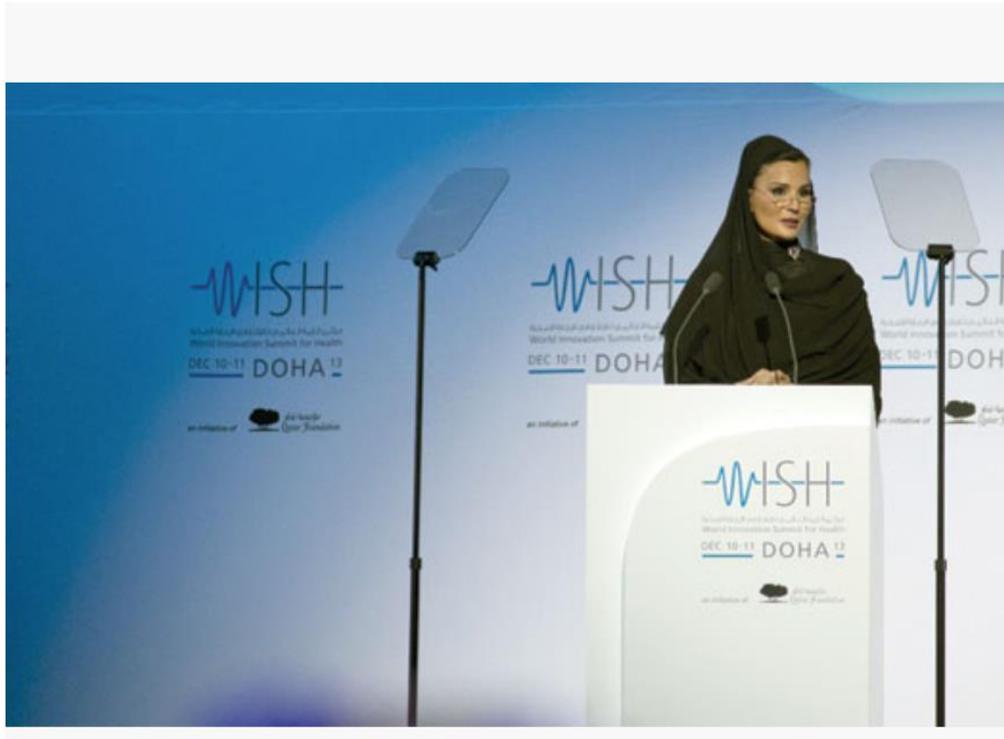


Hital Lashuel, February 2nd, 2025, KFAS/NAMSE

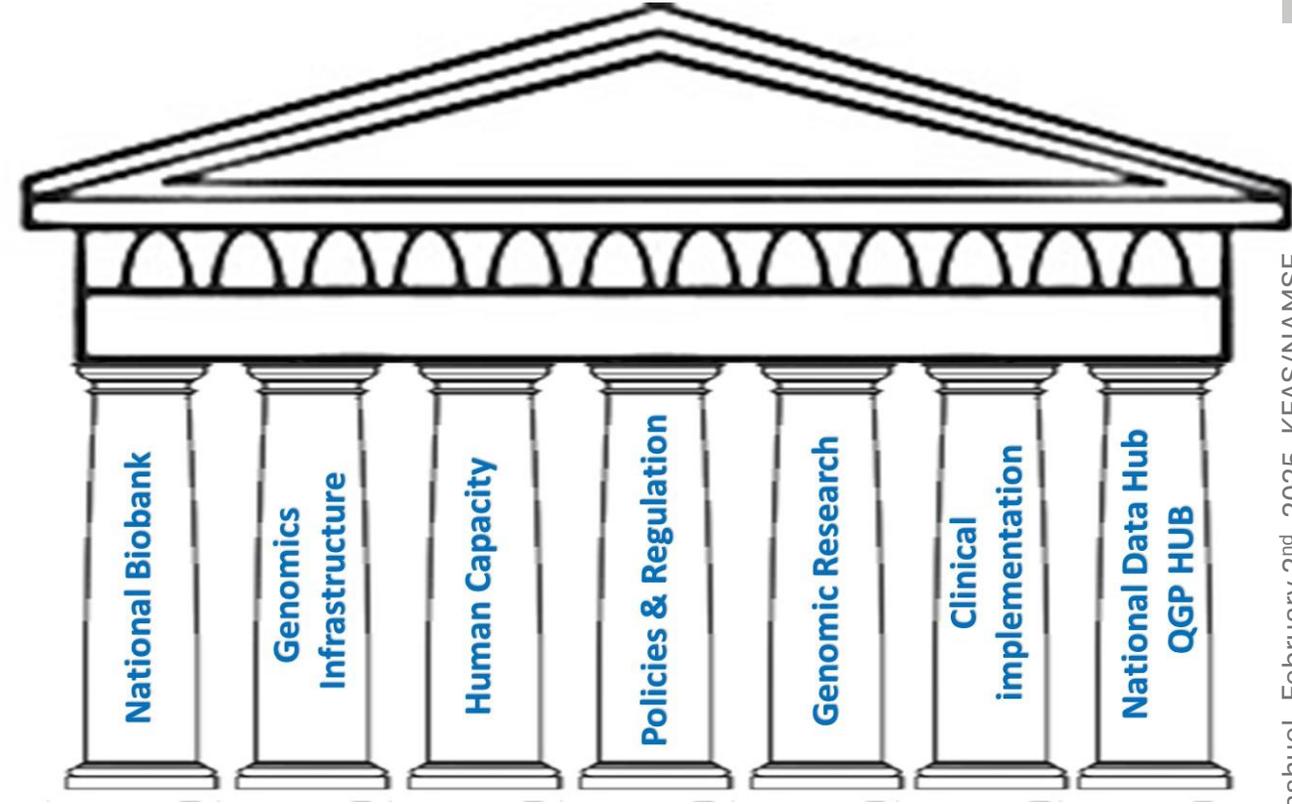
Source: QRDIC Council Calvrate Incites Analytics. InCites dataset updated 2024-01-25. Includes Web of Science content indexed through 2023-12-31.

Qatar launches genome project

PUBLISHED ON DECEMBER 11, 2013 | 02:55 AM



A national project built on “7 Pillars”



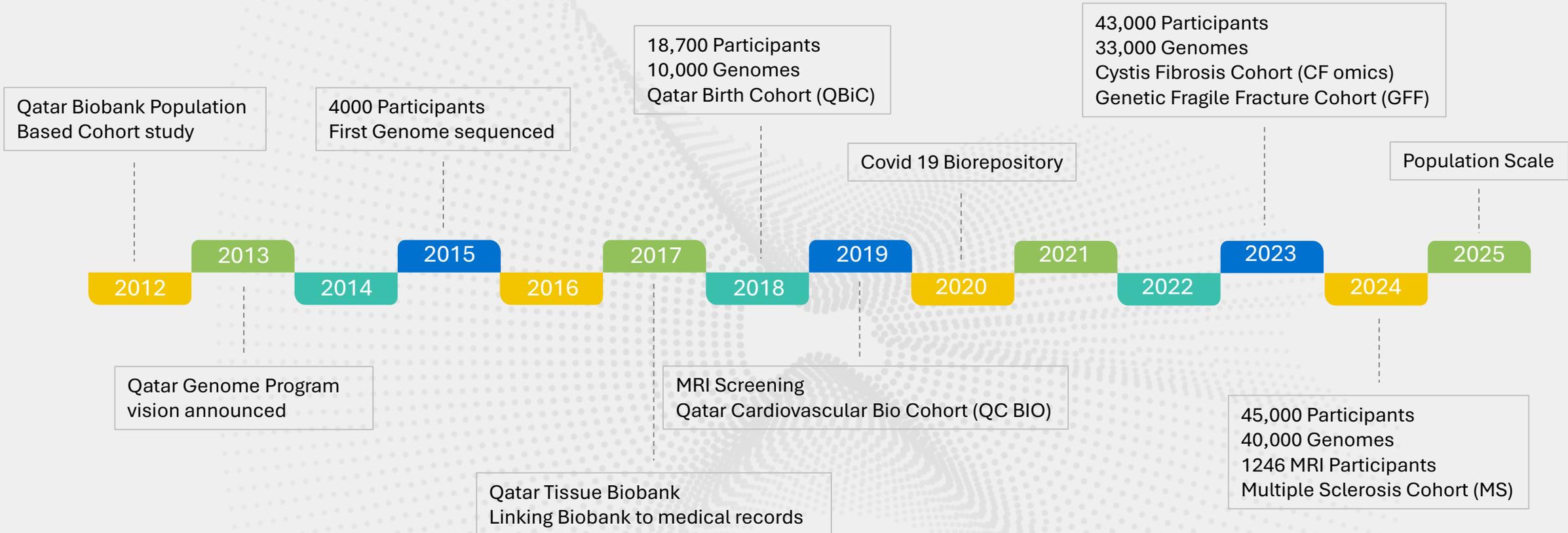
Vision

“Positioning Qatar as a pioneer in the implementation of advanced personalized healthcare”.

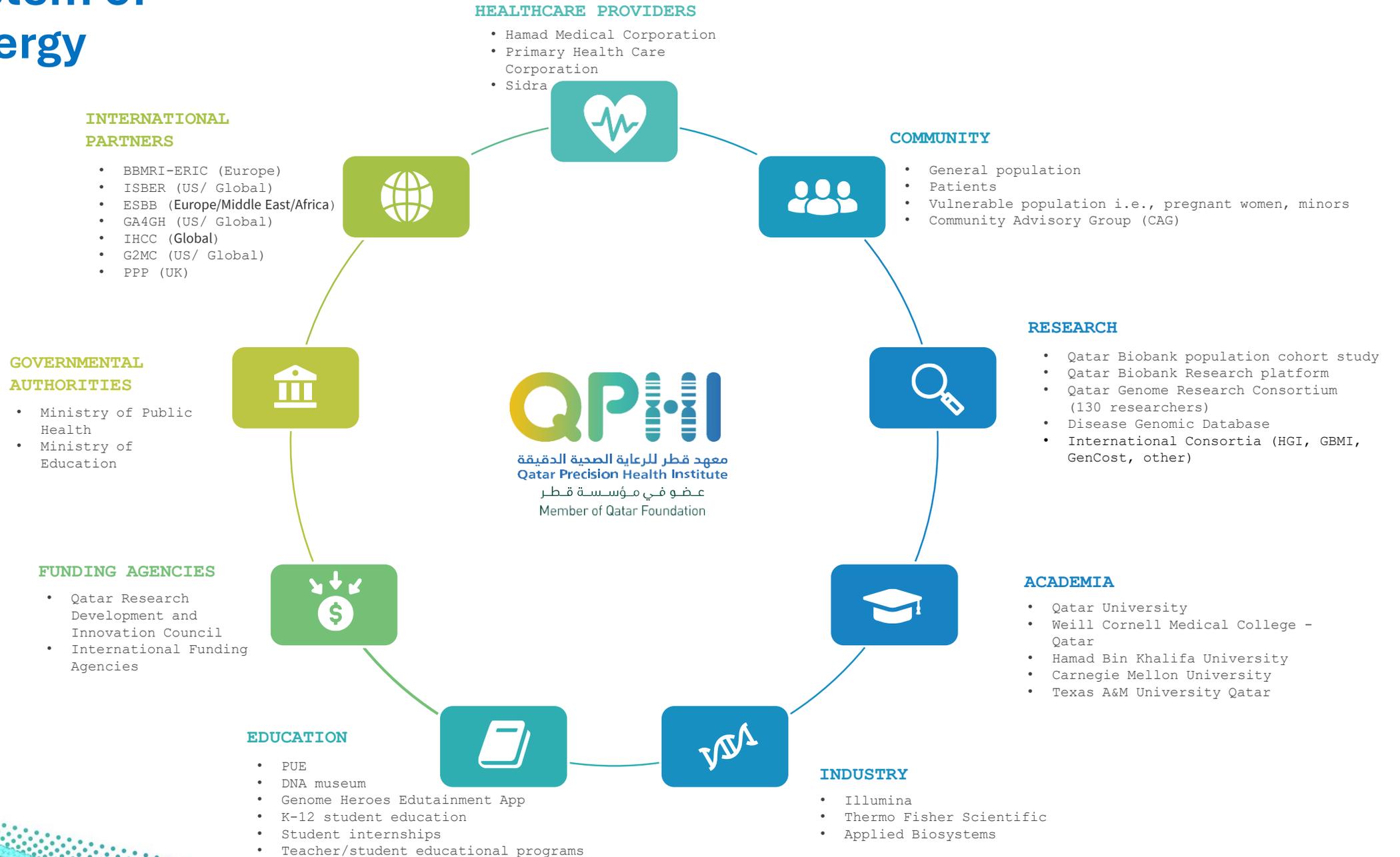
Mission:

“Through innovation and integration of genomic and other ‘omics’ technologies into medical and research practices, Qatar seeks to improve population healthcare and contribute to a knowledge-based economy”.

Qatar Precision Health Institute



Ecosystem of Synergy



Precision Health Ecosystem in Qatar

Qatar Foundation



College of Health and Life Sciences

- Faculty research and collaboration
- Capacity development

Qatar Computing Research Institute

- Bioinformatics and AI-driven healthcare research

Qatar Biomedical Research Institute

- Research neurology, diabetes, and cancer
- State-wide centralized proteomic services

College of Science and Engineering

- Capacity building in AI & healthcare information system

College of Islamic Studies:

- Research on Islamic bioethics, policy advocacy, thought leadership, outreach



QPHI

- Infrastructure & Coordination

Qatar Genome Project /Qatar Biobank

- Omics & Sample repositories and project coordination.



- Translate precision health research into clinical care
- Serve QGP and national genetic sequencing needs
- Focus on rare diseases and pediatric conditions
- Deliver cellular therapies including CART treatments for pediatric conditions



- Deep multiomics phenotyping
- AI applications to PH and wellness
- PH human capacity building
- Commercialization knowhow



- Healthcare policy

Healthcare System



- Regulatory and ethical oversight
- **E-health Hub project & access to clinical records**
- National IRB for research governance
- Policies and quality assurance standards



- Central Laboratory Services with whole in-house exome sequencing of patients for diagnostic purposes
- New precision medicine facility delivering mainly cancer care
- Women's Wellness Research Center creating precision medicine laboratory with long-read sequencing and a bio-repository



- Research on specific cardiovascular issues from a 20K sample cohort and biobank of East Asian workers in partnership with Anti-Doping Laboratory Qatar



- Research genetic causes of injuries in elite athletes, especially ACL injury in female athletes (6x incidence)



- Pilot programs to enable SMART health clinics
- Use genetic analysis for preventative health and wellness plans for patients

Other Entities



- Significant user of the QBB data
- Research and train genetic counselors
- Focus on viral genetics within the Biological Research Center
- Long-read sequencing facility provided by QGP used for pathogen sequencing



- Research into specific characteristics of elite athletes including omics

Research Core Platforms



Clinical Genomics Laboratories

- Whole Genome Sequencing
- Whole Exom Sequencing
- Whole Transcriptome Sequencing
- Small RNA sequencing
- Single cell Sequencing

Genomic Data Science Group

Zebrafish Core Facility

Omics Core Facility

- Automated DNA/RNA extraction
- PacBio long-read sequencing
- Bionano Optical Mapping
- Sanger Sequencing
- Array Genotyping and Methylation
- Nanostring nCounter

Infrastructure Services

Software Development Services

Data Management Services

National Genome Sequencing Facility

Research Core Services



Flow Cytometry Service

- High-Dimension flow cytometry (30+ parameters)
- Cell Sorting 30 parameters
- Nanoparticle Tracking Analysis Phenotypic
- Analysis of microvesicles
- Sperm DNA Fragmentation
- Multiplexed serological assays (CoVID-19)

Advanced Imaging Services

- Advanced confocal systems Zeiss LSM880
- Time-Lapse and Live Cell Imaging
- Z stack and 3-D imaging
- Super resolution Imaging (AiryScan/Fast AiryScan)
- IASFR Capture Microdissection

Proteomics Service

- High-dimension SomaScan assay
- Multiplex bead arrays
- Custom multiplexed Immunoassays

Analytical Chemistry

- Untargeted analysis of lipidome
- Untargeted analysis of metabolome
- Quantification of short-chain fatty acids
- Quantification of saturated, monounsaturated and polyunsaturated fatty acids
- Quantification of amino acids
- Simultaneous quantification of elements by ICP-QOO - under development

Proteomics Service

- High-dimension SomaScan assay
- Multiplex bead arrays
- Custom multiplexed Immunoassays

GMP Lab Services

- Bone Marrow Transplant
- Hematopoietic Stem Cell Transplant
- Cell Therapy
- Gene Therapy
- Regenerative Medicine Production
- Cord Blood banking

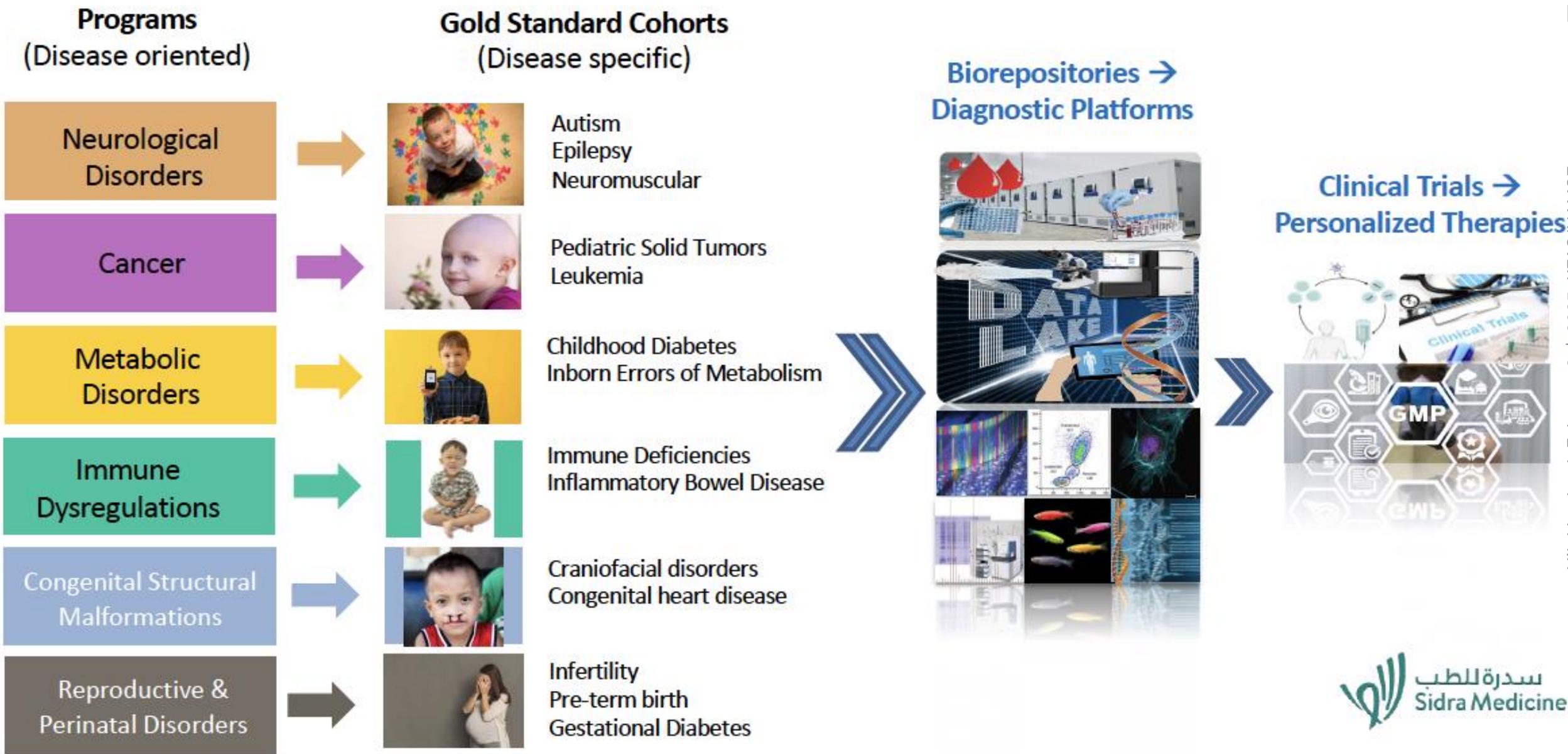


سدرة للطب
Sidra Medicine

Mission

We provide children and women with outstanding tertiary healthcare services in an innovative and ultramodern facility specially designed to promote healing. We collaborate with academic partners, leading research institutions and Qatar's health sector to train students and staff. We will deliver leading clinical and translational research of value to the population of Qatar and the world.

Translational Research Programs



Our Collective Challenge?

How can investments in education and R&D infrastructure be transformed into a thriving innovation ecosystem that fosters startups, attracts foreign investment, and drives economic growth and societal impact?

Can we do it alone?

No

The road least traveled in our region

From Genes to mechanisms, novel targets/pathways, and novel therapies

Validating and translating biomarker discoveries to new diagnostics

Developing novel biomarkers

Our Top Priority: LOCALIZING DISCOVERIES and INNOVATIONS:
Building a Strong Translational Pipeline and a Foundation for
Technology Transfer, Innovations and Startups

Our Precision Health Priorities

- Accelerating PM/PH clinical implementation
- Building an Entrepreneurship and Startup Ecosystem to Drive Innovation in Precision Health
 - Industry engagement and partnerships

Attract International Funding
"Yes, We Can!"

Funding follows those who tackle the hardest scientific questions and address critical unmet needs.

What is missing/next?

- Inject new funding into the system to drives progress, fuels innovation, and ensures sustainable growth
- Build Critical Mass
- Invest in Innovation/Science Parks/Incubators
- Address regulatory gaps
- Incentivize and promote industry engaement and partnerships (e.g., clinical trials/drug discovery)
- **Expand regional and global collaborations**

Building local synergies and fostering collaborations within a coordinated ecosystem is an essential foundation for impactful international partnerships

- Strategic alignment
- Integration
- Consolidating our efforts
 - Investment and Research
 - Regional and Global visibility

• *We are stronger and more impactful as a unified and integrated ecosystem than isolated institutions.*

QF Precision Health
Thematic Executive
Committee

Qatar National Precision
Health Executive
Committee

Redefining and Rethinking Global Collaborations

International Partnerships foster mutual learning and create synergies that amplify impact.

Redefining Collaborations

- Focusing on niche areas and unique challenges and opportunities that are specific to the region with the aim of global impact.
- Prioritizing areas that align with our priorities, investments and strategic goals

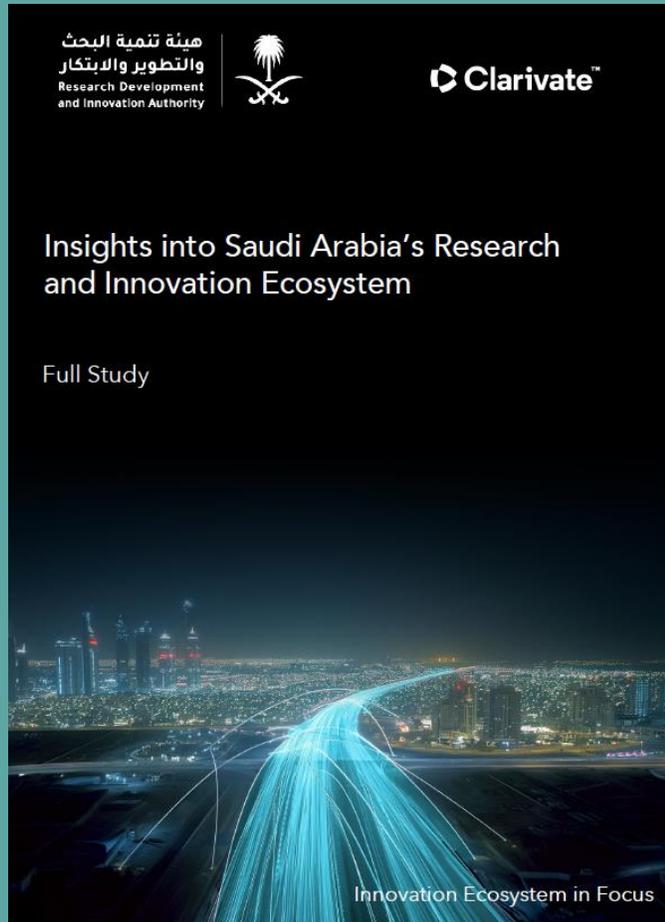
Rethinking Collaborations

- Shifting focus from capacity building to co-creation and co-innovation
 - Focus on attracting international funding to support local research
- Focus on collaborations that push boundaries and define the future innovation landscape and opportunities

Regional Collaborations: Leveraging our strengths

- Small populations
- Integrated healthcare systems
- Distinct genetic lineages
- Understudied Populations
- Arab countries are genetic treasure troves, offering unique opportunities to uncover disease causes and pioneer solutions for rare conditions.
- Greater prevalence of recessive genetic disorders, providing valuable insights into the genetic underpinnings of diseases.
- EM/HRs
- Similar language and culture
- Proximity

Limited Regional Collaboration: A Barrier to Local Scientific Growth



*“While publication rates have risen, countries in the MENA have collaborated very little with each other. In 2019, **only 5% of articles had a co-author from another country within the region.** This low level of regional collaboration indicates a certain **dependency on scientific expertise from overseas.**”*

Relying heavily on international partnerships outside the region can limit the development of local research networks and hinder the growth of regional expertise.”



Figure 36: Top 10 collaborating countries with Saudi Arabia



Figure 14: Top 10 collaborating countries with Saudi Arabia in the period 2014-2023

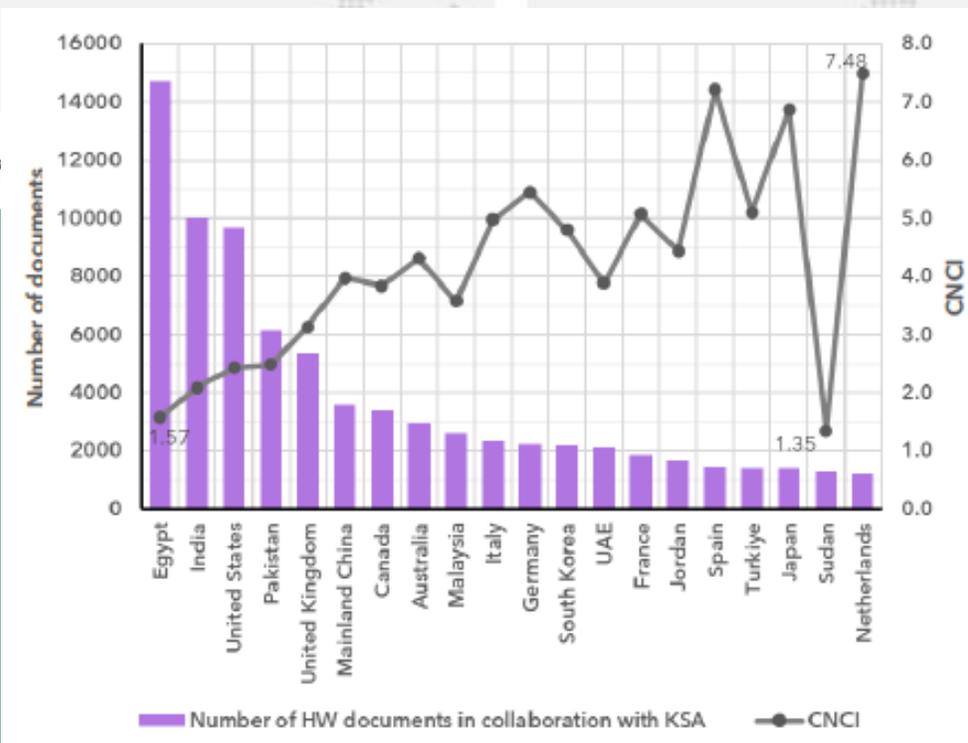


Figure 35: Top 20 collaborating countries with Saudi Arabia in the area Health and Wellness in the period 2014-2023

Shaping the Future of Precision Health in the Middle East: The Case for Competitive Collaboration

11/06/08

Gulf states should work together on research

Weill Cornell Medical College in Qatar's Education City, was the first American medical school established overseas Copyright: Flickr/Vobios



By: **Wael K. Al-Delaimy and Hilal A. Lashuel**



A regional strategy and a focus on capacity building would strengthen Gulf investments in S&T, say *Wael K. Al-Delaimy and Hilal A. Lashuel*.



We and many fellow Arab scientists have been following the development of ambitious research and education projects in Gulf countries with great interest.



Healthy scientific research competitiveness would still ensure different countries have a leading edge in particular scientific areas. Something similar happens in the United States, for instance, between Harvard University and the Massachusetts Institute of Technology (MIT). Located in the same city, they compete with each other and have their own unique research profile and reputation. Yet their scientists and institutions collaborate, building on their respective strengths and synergies. Examples of their joint initiatives include The Broad Institute of MIT and Harvard, and The Harvard-MIT Division of Health Sciences and Technology.

Developing a regional strategy

Gulf states should establish joint committees to coordinate and develop initiatives that enhance national capabilities and regional competitiveness in science and technology. They could help put the region on the global research map by identifying economically important and regionally relevant research areas to focus on.

Harnessing Competition for Collective Success

The Case for Competitive Collaboration:

Leveraging healthy competition to foster innovation while collaborating on shared goals.

Benefits

Shared resources, accelerated progress, and mutual learning.

Pooling resources and expertise

Accelerating data generation and analysis

Bridging knowledge and infrastructure gaps

Enhancing policy development and regulatory alignment

How?

Cross-boarder initiatives in PH

Regional consortia and data-sharing platforms

Coordinated training programs

Funding mechanisms that encourage collaborations

Harmonizing regulatory frameworks and data-sharing policies

Precision Health: Opportunities

- Preventive Health and Wellness
- Integration of social, health and molecular determinants of health (*genomic, transcriptomic, proteomic, metabolomic, etc*)
- Integration of **multi-omics** data with clinical and wearable data.
- Patient-Centered Care and Decision Support
- Bringing precision health to homes: Integration into daily life, Remote Diagnostics, Wearable and Remote Monitoring, Predictive models, Portable Imaging Devices with AI
- Pioneering affordable innovations in precision health is essential to ensure equitable access and empower individuals to take responsibility for their health.
- Empowering individuals to take control of their health through effective integration of wearables, AI and machine learning into healthcare and wellness and bringing preventive care to the patients environment and daily routines.
- Training programs for researchers, clinicians, and data scientists in precision health.

Thank You

“We prepared for the future, and, in time, found ourselves living in it”

H.H. Sheikha Moza Bint Nasser



QATAR DAY
اليوم قطر



2025

