



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION

国际创新药学院

Race Medicine and Use of Precision Medicine

PF2: The Scientist: Professional Formation 2

Assoc Prof. Caoimhe Clerkin (Credit to Prof. Marian Brennan)

3.4.25



RCSI

Leading the world
to better health



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

Leading the world
to better health



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

What ethnic group does this woman belong to?

- White
- Hispanic/Latino
- Black/ African American
- Native American
- Asian
- Other



RCSI

Leading the world
to better health

Dorothy Roberts had a white father and black mother.

What race does she belong to now?

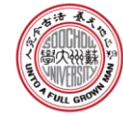


Race is a social construct

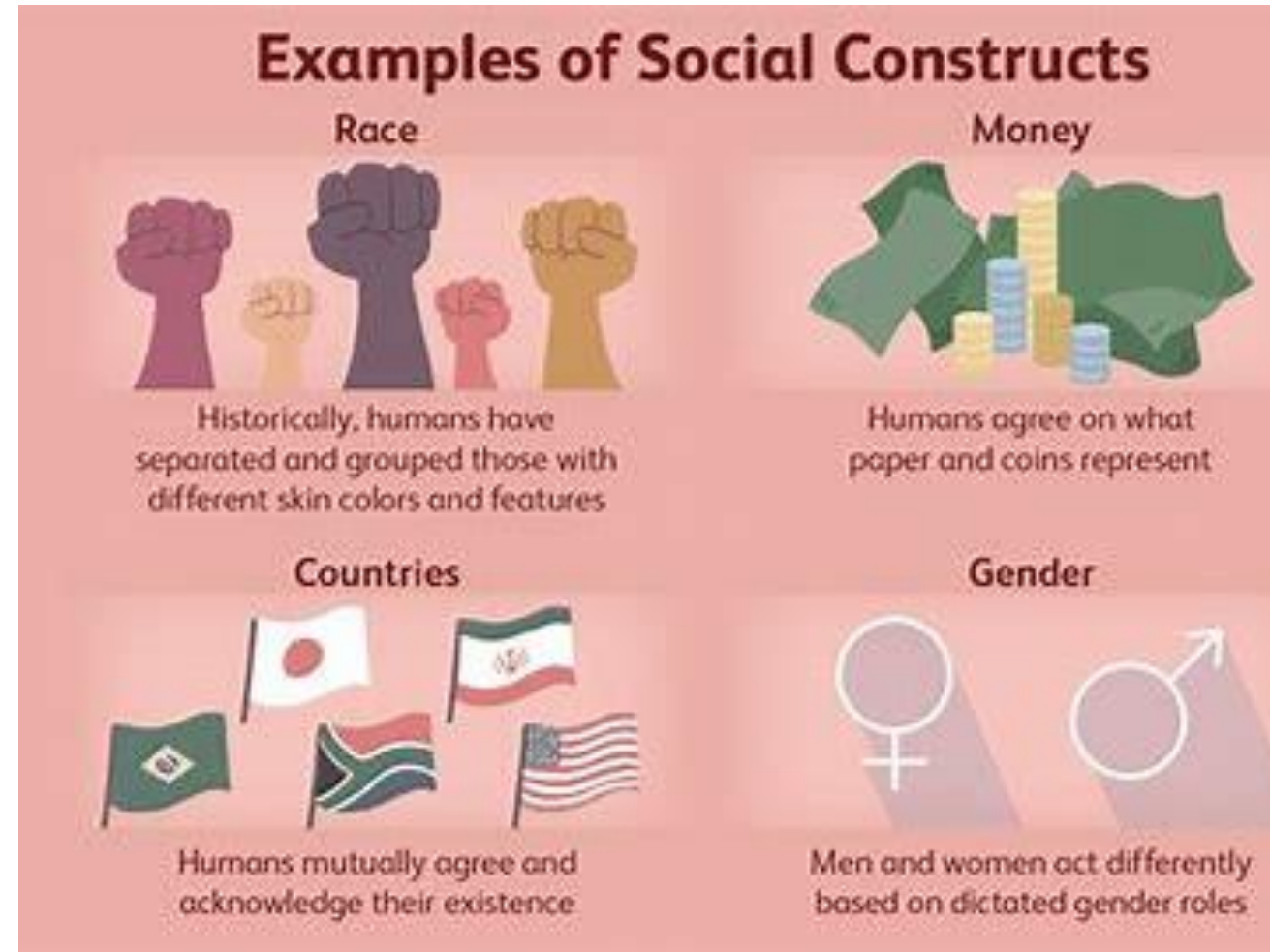
Your genetic make up is influenced by your parents, grand parents, great grandparents. Treating an individual with black skin, who has white ancestors could lead to false medical predictions and fatal medical outcomes

The term race is a crude simplistic effort to categorise people.

It is an example of a social construct, meaning that it has been formed as a result of human interactions i.e. it exists because people agree that it exists.



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

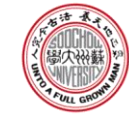
Leading the world
to better health



RCSI

Leading the world
to better health

Race inequality in healthcare



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

The BMJ 2020 publication highlighted an undermined care for ethnic minorities in the UK. For example, maternal mortality is unequal in black mothers

This work led to an investigation, review and update of guidelines.

thebmj

covid-19

Research ▾

Education ▾

News & Views ▾

Campaigns ▾

Jobs ▾

Racism in medicine

**Racism
in
medicine**



It has been five years since the publication of a special issue of The BMJ dedicated to Racism in Medicine. The 2020 themed issue launched wider coverage in the journal of the issues that affect patients and doctors from ethnic minority backgrounds. But what has happened since February 2020? The landscape has certainly changed. We've had the covid-19 pandemic, a surge in the Black Lives Matter movement, and the race riots in England last summer. But are NHS organisations and regulators responding better to the discrimination and differential attainment experienced by doctors from ethnic minority backgrounds and are ethnic health inequalities narrowing? These are some of the questions we wanted to answer in a series of articles we commissioned to mark the 5th anniversary of The BMJ's special issue.

<https://www.bmj.com/racism-in-medicine>



RCSI

Leading the world
to better health



Race and Medicine

The Race and Medicine collection reflects NEJM's commitment to understanding and combating racism as a public health and human rights crisis. Our commitment to antiracism includes efforts to educate the medical community about systemic racism, to support physicians and aspiring physicians who are Black, Indigenous, and people of color, and ultimately to improve the care and lives of patients who are Black, Indigenous, and people of color.

POINTS OF VIEW

Sitting in Our Discomfort

K. Gates

Despite renewed awareness of deep health disparities, many of the clinicians who had gathered for a talk on obesity chose to leave afterward, rather than stay to hear about implicit bias and

PERSPECTIVE

Research Participation in Marginalized Communities

K. Armstrong and C. Ritchie

Despite an increased focus on community engagement in



Racial Disparities in Clinical Medicine

Conversations, Perspectives,
and Research on Advancing
Medical Equity





Racism in Medicine

The NEW ENGLAND JOURNAL of MEDICINE

MEDICINE AND SOCIETY

Debra Malina, Ph.D., Editor

Embracing Genetic Diversity to Improve Black Health

Reparations as a Public Health Priority — A Strategy for Ending Black–White Health Disparities

Mary T. Bassett, M.D., M.P.H., and Sandro Galea, M.D., Dr.P.H.

Misrepresenting Race — The Role of Medical Schools

The NEW ENGLAND JOURNAL of MEDICINE

Debra Malina, Ph.D., Editor

SPECIAL REPORT

Editorial JOURNAL of MEDICINE

Diversity of the National Medical Student Body — Four Decades of Inequities

Devin B. Morris, B.A., Philip A. Gruppuso, M.D., Heather A. McGee, Ph.D., Anarina L. Murillo, Ph.D., Atul Grover, M.D., Ph.D., and Eli Y. Adashi, M.D.

Medicine and medical science: Black lives must matter more



Combating Anti-Asian Sentiment — A Practical Guide for Clinicians

James H. Lee, M.D.

Sticks and Stones — Confronting the Full Spectrum of Racism

Lisa Cauley, M.D., M.P.H.

Perspective

Moving towards anti-racist praxis in medicine



Racist Like Me — A Call to Self-Reflection and Action for White Physicians

Deborah Cohan, M.D., M.P.H.

I am racist. I would love to believe otherwise and can find evidence that I am not — my ca-

port of colleagues and trainees who are people of color, my sc-

on the implicit-association tes-

tients, n-

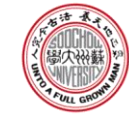
passion b-

ct against



RCSI
Leading the world
to better health

Learning Outcomes



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

1. Outline the underlying reasons for health disparities
2. Recognise that the term 'race' only refers to your social setting
3. Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials
4. Discuss the development of artificial intelligence technology
5. Explain the role of precision medicine

We will have a pop quiz at the end of today. So pay attention!!

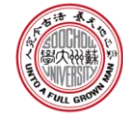


RCSI

Leading the world
to better health

Learning Outcome 1:

Outline the underlying reasons for health disparities



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

There are a number of reason for health disparities. However, a number of reasons include

- **Limited access to health data globally.** E.g. Ireland would have limited access to Chinese health data and the Chinese population in Ireland would contribute to a small amount of the Irish population
- **Discrimination due to bias-** there is a common misconception that black people feel less pain than white people. Does this mean black people do not receive pain medication?
- **Health guidelines include race-specific treatments.**



RCSI

Leading the world
to better health

Learning Outcome 2: Recognise that the term 'race' only refers to your social setting

Dorothy Roberts had a white father and black mother.

Categorising Dorothy as black is incorrect and only helps the human race to generalise populations



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Learning Outcome 3:

Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

SO WHAT?

© Can Stock Photo - csp16511322



RCSI

Leading the world
to better health

Example



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

A test for kidney function is measuring

1. Creatinine levels in the blood. This should be in the range of 0.6-1.2 mg/dl. Outside of this range would indicate that the kidneys are not effectively clearing compounds.

2. The next test would be to measure the estimated glomerular filtration rate. The normal glomerular filtration rate should be around 90 ml/min per 1.73 m²



RCSI

Leading the world
to better health

Example

Creatine levels: 2.8 mg/dl
Kidneys not effectively clearing
eGFR: 18 ml/min per 1.73 m²
severe kidney function



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

Leading the world
to better health

Example

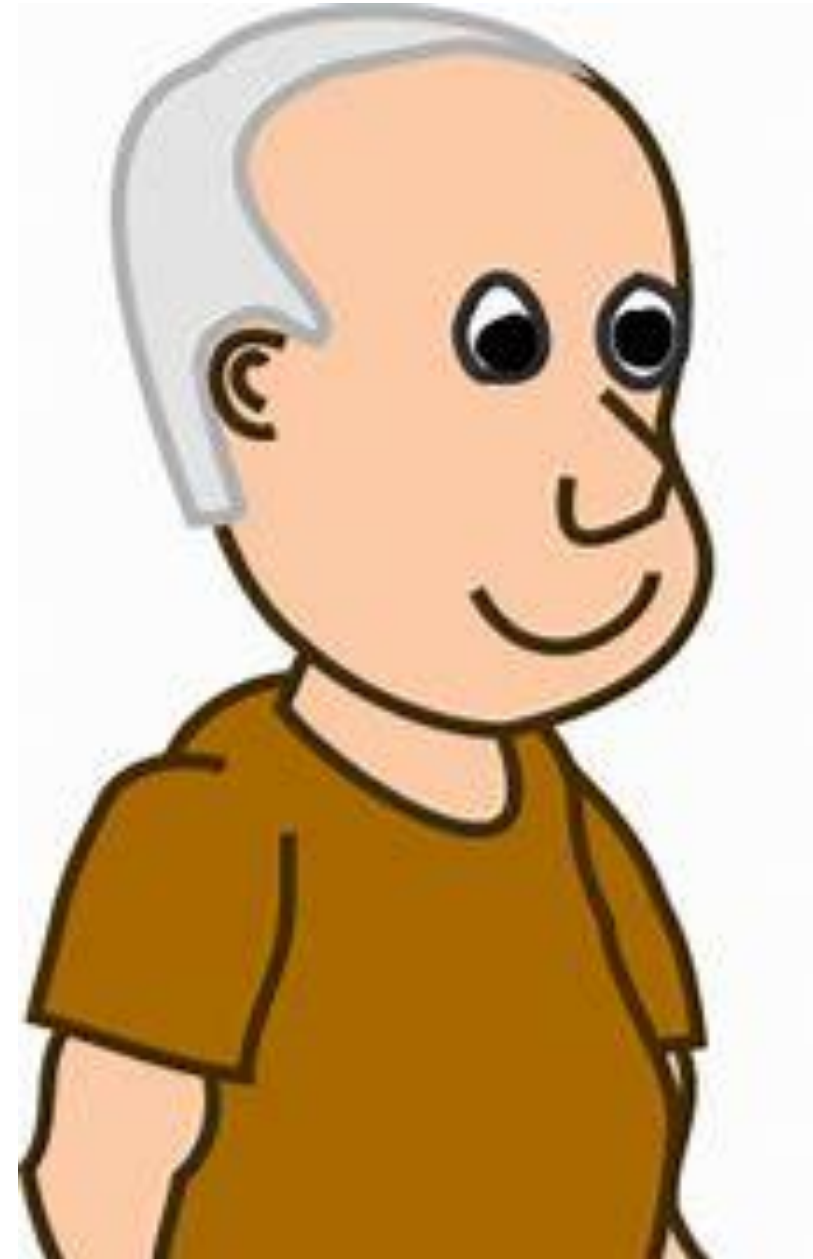
Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m²

severe kidney function

Goes onto the transplant list based on
healthcare guidelines



Example

Creatine levels: 2.8 mg/dl

Kidneys not effectively clearing

eGFR: 18 ml/min per 1.73 m²

severe kidney function

No action based on healthcare guidelines



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI
Leading the world
to better health

Example



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Creatine levels: 2.8 mg/dl
Kidneys not effectively clearing
eGFR: 18 ml/min per 1.73 m²
severe kidney function

What approach is taken here?



RCSI

Leading the world
to better health

Another example



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria



RCSI

Leading the world
to better health

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

Less criteria to be considered treat with antibiotics according to health care guidelines



Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

The infection is further progressed before diagnostics/treatment according to health guidelines



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

Leading the world
to better health

Another example

Children who present with symptoms of a urinary tract infection (UTI) are usually treated with antibiotics if they meet certain criteria

The infection is further progressed before diagnostics/treatment according to health guidelines



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

Leading the world
to better health

Learning Outcome 3:

Identify that race categories for clinical trials may be biased and outline the importance of including diverse groups in clinical trials

Guidelines are based on flawed categorisation

It is imprecise to categorise patients

Race categories for patient care may have huge implications in treatment approaches and results.



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



RCSI

Leading the world
to better health

Race Adjustments



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



Cardiology

AHA Get with the Guidelines—Heart Failure⁹
→ Race correction lowers risk for non-white patients leading to deprioritization patients of colour



Obstetrics

VBAC score predicts poorer outcomes for POC



Urology

Stone score- returns lower score for persons of colour adjustment equivalent to haematuria.



Pulmonary function tests

10-15% adjustment for black patients
→ Increases threshold for diagnosis and treatment e.g. COPD and asthma



Oncology

Rectal cancer survival calculator- estimates worse outcomes for POC, thus potentially influencing whether to treat or not.



Paediatrics

Non-white children are required to meet more diagnostic criteria to be considered for investigations and treatment for UTI.

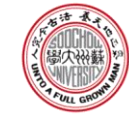
Hidden in Plain Sight — Reconsidering the Use of Race Correction in Clinical Algorithms Darshali A. et al. NEJM 2020



RCSI

Leading the world
to better health

Removal of race guidelines



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

AAP News

Retirement of UTI guideline among AAP efforts to end race-based medicine

August 05, 2021



"Given the clear evidence and overwhelming consensus that action was needed, the AAP Board of Directors took this firm stance against the use of race-based medicine in our current and future policies and is continuing its efforts to address previous harms and promote equity and transparency throughout all AAP core activities and functions, including education, programs, policy and research."

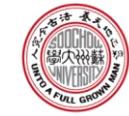
"when practiced in good faith, race-based medicine is bad medicine that leads to inequitable medical care and hurts the health and well-being of people of color,"



RCSI

Leading the world
to better health

Changing practice guidelines



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Task force were asked to

1. Clarify the problem
2. Evaluate the approaches
3. Provide recommendations



AJKD

Special Report

A Unifying Approach for GFR Estimation: Recommendations of the NKF-ASN Task Force on Reassessing the Inclusion of Race in Diagnosing Kidney Disease



Cynthia Delgado, Mukta Baweja, Deidra C. Crews, Nwamaka D. Eneanya, Crystal A. Gadegbeku, Lesley A. Inker, Mallika L. Mendu, W. Greg Miller, Marva M. Moxey-Mims, Glenda V. Roberts, Wendy L. St. Peter, Curtis Warfield, and Neil R. Powe

Background: In response to a national call for re-evaluation of the use of race in clinical algorithms, the National Kidney Foundation (NKF) and the American Society of Nephrology (ASN) established a Task Force to reassess inclusion of race in the estimation of glomerular filtration rate (GFR) in the United States and its implications for diagnosis and management of patients with chronic kidney disease.

creatinine equation refit without the race variable in all laboratories in the United States because it does not include race in the calculation and reporting, included diversity in its development, is immediately available to all laboratories in the United States, and has acceptable performance characteristics and potential consequences that do not disproportionately affect any one group of individuals.

[Visual Abstract online](#)

Complete author and article information provided before references.

Correspondence to C. Delgado (Cynthia.Delgado@ucsf.edu) or N.R. Powe (Neil.Powe@ucsf.edu)

"The UK Kidney Association supports NICE and recommends that the adjustment for black ethnicity for eGFR be removed from UK practice."

<https://ukkidney.org/>



RCSI

Leading the world
to better health

Changing practice guidelines



2023

Home ▶ About ▶ Newsroom ▶ Press Releases ▶ Press Releases from the ATS ▶ Press Releases from the ATS ▶ ATS Publishes Official Statement on Race, Ethnicity and Pulmonary Function Test Interpretation

Press Releases from the ATS

- > 2023
- > 2022
- > 2021 Press Releases
- > 2020 Press Releases
- > 2019 Press Releases
- > 2018 Press Releases
- > 2017 Press Releases
- > 2016 Press Releases

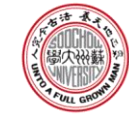
ATS Publishes Official Statement on Race, Ethnicity and Pulmonary Function Test Interpretation

The [American Thoracic Society](#) has issued an [official statement for clinicians that explains why race and ethnicity should no longer be considered factors in interpreting the results of spirometry](#), the most commonly used type of pulmonary function test (PFT). The statement was endorsed by the European Respiratory Society. The full statement is available online in the [American Journal of Respiratory and Critical Care Medicine](#).

Spirometry is a breathing test that measures how much air is going into an individual's lungs, and how rapidly air is inhaled and exhaled. It can be used to diagnose and track the severity of such respiratory diseases as asthma and [chronic obstructive pulmonary disease](#).

Race-specific equations or adjustments are currently used in the interpretation of PFT results. This approach requires results

The World Medical Association



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Declares racism to be a public **threat**

Asserts that **racism is based on a social construct with no basis in biological reality** and that any effort to claim superiority by exploiting racist assumptions is unethical, unjust and harmful

Recognises that the experience of racism is a social determinant of health and responsible for persistent health inequities

<https://www.wma.net/policies-post/wma-declaration-of-berlin-on-racism-in-medicine/>



RCSI

Leading the world
to better health

Learning Outcome 4: Discuss the development of artificial intelligence technology



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Who uses AI?



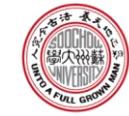
Learning Outcome 4:
Discuss the development of
artificial intelligence
technology

What are we using AI for?



Learning Outcome 4:

Discuss the development of artificial intelligence technology



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

How does AI work in medicine?



RCSI

Leading the world
to better health

Learning Outcome 4:

Discuss the development of artificial intelligence technology

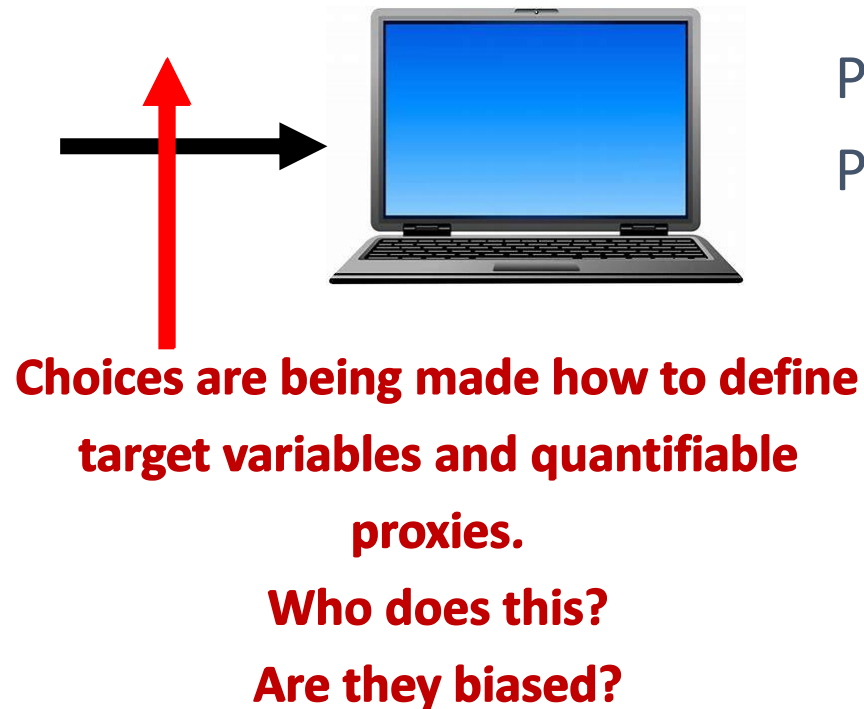


INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院



Health Care Data

What data is being used?
Is there bias in the data?



Predicts an outcome
Proposes a treatment approach



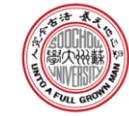
Interpreter may be biased
Continued use may train your AI to become even more biased



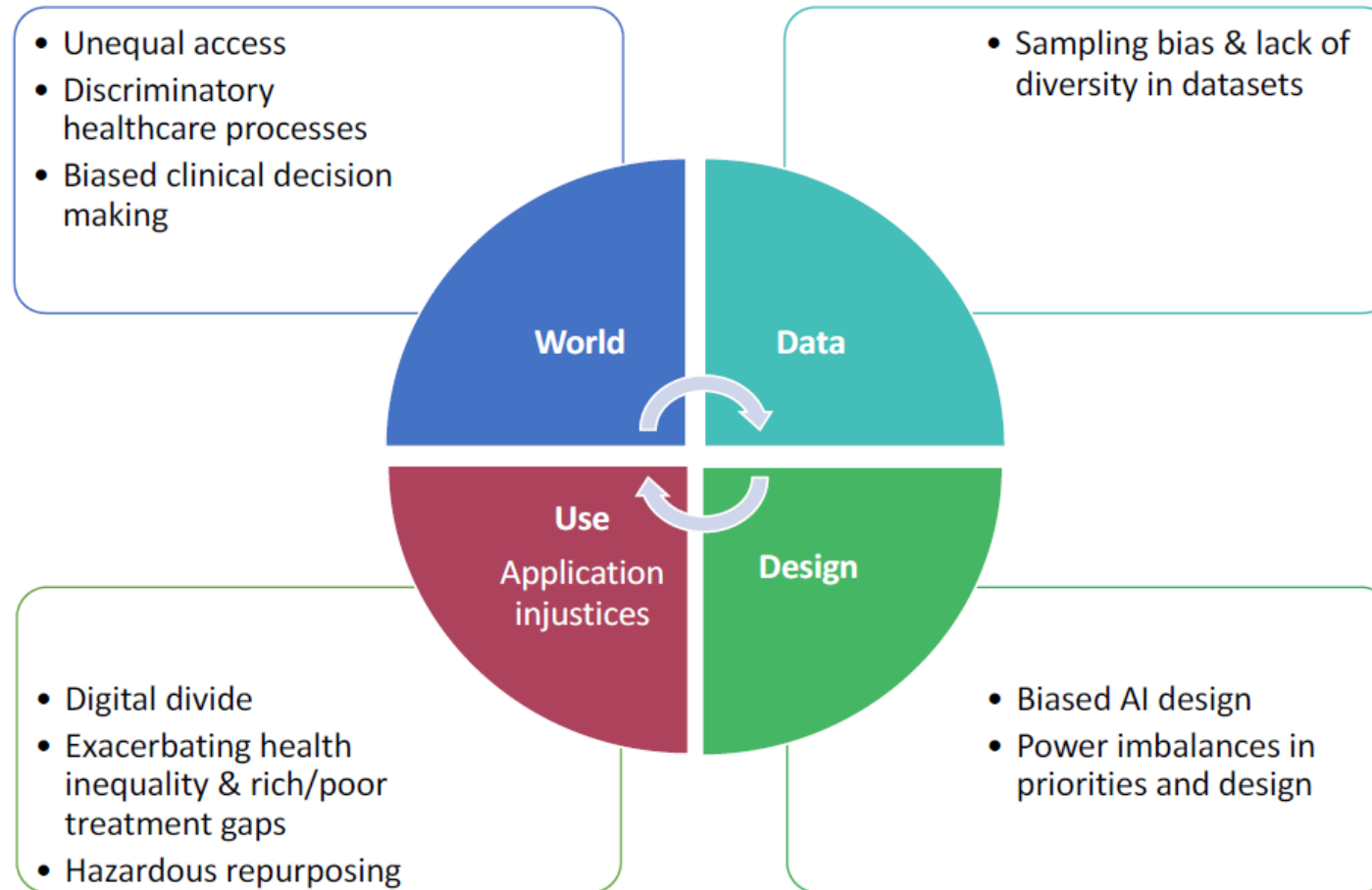
RCSI
Leading the world
to better health

Learning Outcome 4:

Discuss the development of artificial intelligence technology



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

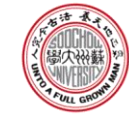


Adapted from: Does “AI” stand for augmenting inequality in the era of covid-19 healthcare? <https://www.bmi.com/content/372/bmi.n304>



RCSI

Leading the world
to better health



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

What is the solution?



RCSI

Leading the world
to better health

Learning Outcome 5: Explain the role of precision medicine



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

NCI definition:

A form of medicine that uses information about a person's own genes or proteins, to prevent, diagnose or treat disease.

FDA definition:

Precision medicine, sometimes known as 'personalised medicine' is an innovative approach to tailoring disease prevention and treatment that takes into account differences in peoples genes, environments, and lifestyles. The goal of precision medicine is to target the right treatments to the right patients at the right time.



RCSI
Leading the world
to better health

Learning Outcome 5: Explain the role of precision medicine



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

This is not a new technique. Take for example blood donations. Only certain blood groups can donate blood to certain individuals, and only certain individuals can receive blood from certain blood groups.

This is because on our red blood cells there are proteins. If these proteins do not exist on the receivers blood group they see this as being “foreign” and will destroy and eliminate the cell, resulting in blood rejection.

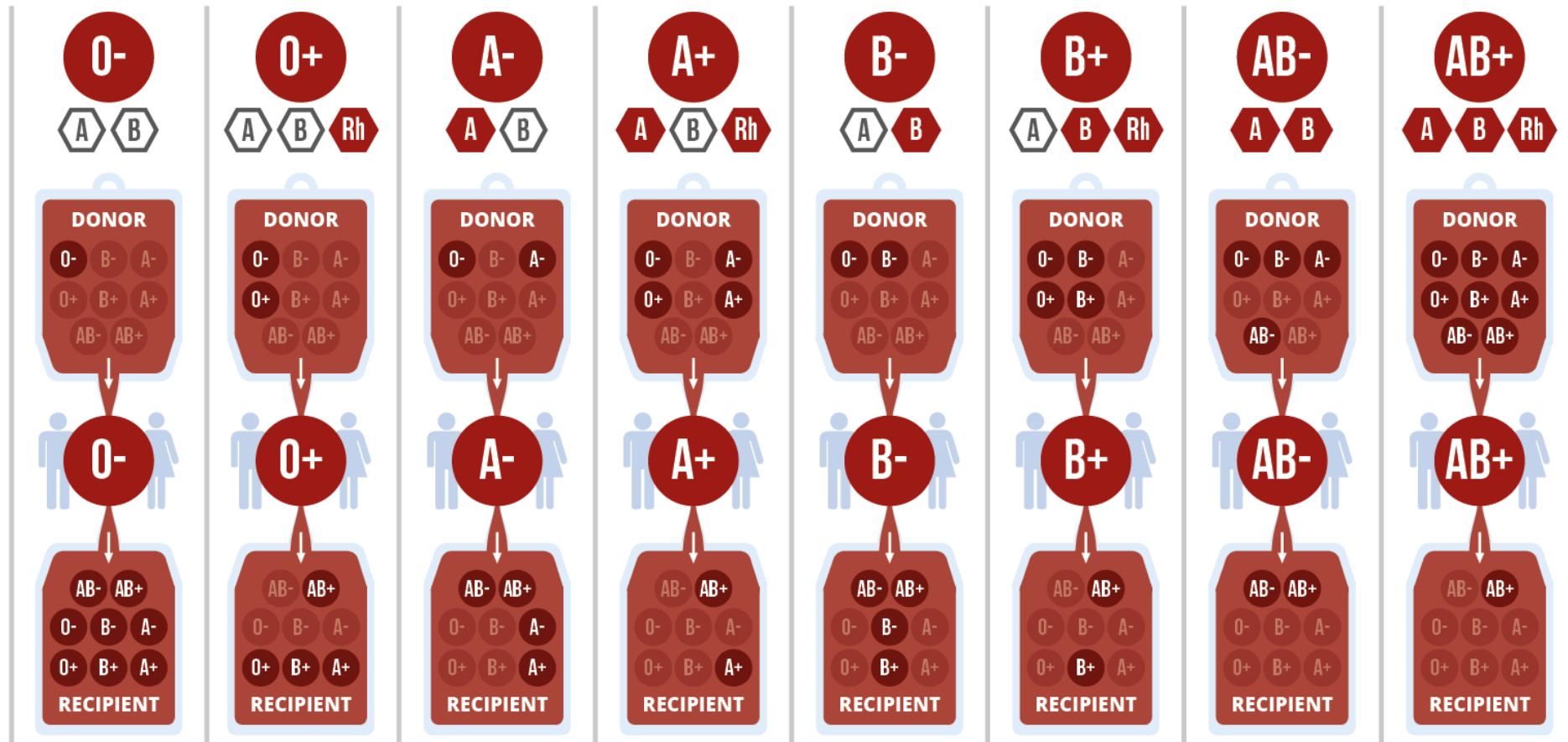
Therefore, we must identify individual blood typing before receiving blood donations



RCSI

Leading the world
to better health

BLOOD TYPE COMPATIBILITIES



KEY

ANTIGEN (Red hexagon)

ANTIBODY (White hexagon)

Blood types are determined by 'antigens', substances found on the surface of red blood cells. A, B, and Rh are possible antigens; they are genetically determined, and can appear alone or in combination. Antigens are destroyed by antibodies in blood plasma if they're not recognised by the body's immune system, which is why not all blood types are compatible.



© Andy Brunning/Compound Interest 2018 - www.compoundchem.com | Twitter: @compoundchem | FB: www.facebook.com/compoundchem
This graphic is shared under a Creative Commons Attribution-NonCommercial-NoDerivatives licence.



RCSI

Leading the world
to better health

Learning Outcome 5: Explain the role of precision medicine



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Another example, is in the treatment of breast cancer.

Some breast cancers, particularly aggressive forms of breast cancer, have a protein HER2.

Therefore to treat this form of breast cancer, treatments are designed to target this specific protein i.e. Herceptin targets the HER2 protein in cells.

Herceptin has no effect if the HER2 protein is not expressed in the cell and therefore has no therapeutic effect on other forms of breast cancer.



RCSI

Leading the world
to better health

Learning Outcome 5: Explain the role of precision medicine



INTERNATIONAL COLLEGE
OF PHARMACEUTICAL
INNOVATION
国际创新药学院

Another example, is in the treatment of breast cancer.

Some breast cancers, particularly aggressive forms of breast cancer, have a protein HER2.

Therefore to treat this form of breast cancer, treatments are designed to target this specific protein i.e. Herceptin targets the HER2 protein in cells.

Herceptin has no effect if the HER2 protein is not expressed in the cell and therefore has no therapeutic effect on other forms of breast cancer.

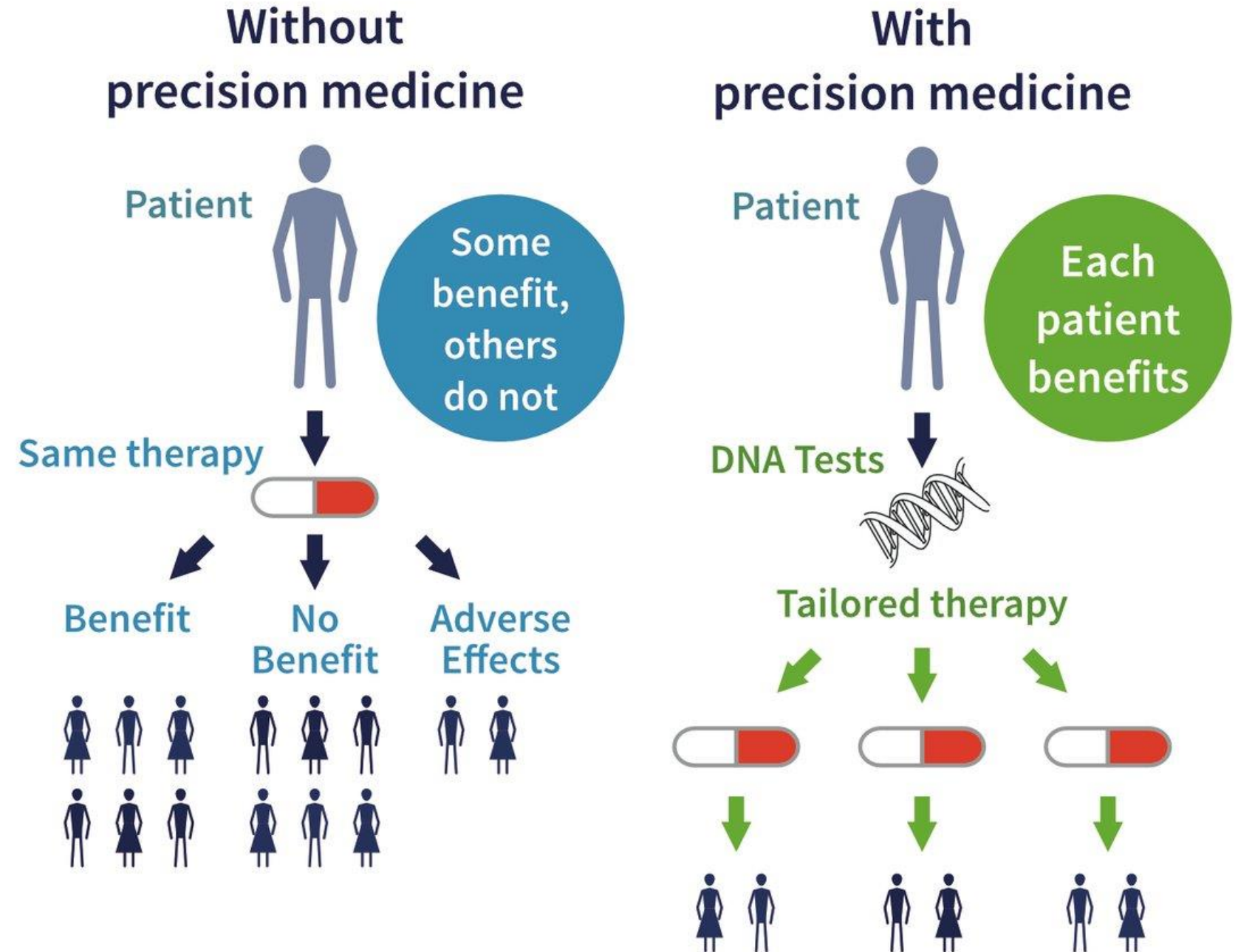


RCSI

Leading the world
to better health

Learning Outcome 5: Explain the role of precision medicine

Therefore, by identifying a person's genetic makeup or the proteins they express we can tailor our diagnostic and therapeutic approaches.



Race POP QUIZ

