Health & Ageing Conference 2021
What will it take to ensure a healthy recovery from COVID-19?

Day 1: 2 December 2021, 10:00–16:30 GMT
Part 2: Disruptive forces in health & life insurance
Health & Ageing Conference 2021
Session 4: Longevity and retirement – Disruptive technologies and their influence on practice

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Longevity and retirement – Disruptive technologies and their influence on practice

Genomic medicine and how it influences longevity.

Emma Wilkins
02.12.2021
Genomics vs Genetics

- The study of an organism’s complete set of genetic information.
- The genome includes both genes (coding) and non-coding DNA.
- ‘Genome’: the complete genetic information of an organism.

- The study of heredity
- The study of the function and composition of single genes.
- ‘Gene’: specific sequence of DNA that codes for a functional molecule.

What is a genome?

- Your genome is one whole set of all your genes plus all the DNA between your genes.
- There are around 20,000 genes in your genome.

What is genomics?

- Genomics is the study of the whole genome and how it works, but has also come to have a broader meaning to include the way that the genome is interpreted and the technologies that have been developed because of it.

Why?

- Looking at the whole genome will help us understand how disease develops and which treatments will be most effective.
Genomic medicine and how it influences longevity

The systematic application of genomic technologies has the potential to transform patients’ lives by:

• Enabling a **quicker diagnosis** for patients with a rare disease, rather than years of uncertainty, often referred to in rare disease as the ‘diagnostic odyssey’.
• Matching people to the **most effective medications** and interventions, reducing the likelihood of an adverse drug reaction.
• Increasing the number of people **surviving cancer** each year because of more accurate and early diagnosis and more effective use of therapies.

While current usage of genetics-based tools and products is relatively low, due in part to the regulatory landscape for many regions, there is a clear opportunity for genetics to support policyholders living longer and healthier.

• Increased participation and willingness on the part of the policyholder / claimant to improve or maintain health
• Offered as a perk to policyholders
• Increase new policy sales
CoronaVirus Covid-19

Positive

Negative
Genomic medicine and how it influences longevity
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Genomic medicine and how it influences longevity

- 13% currently have a focus on genetics or a genetics-related initiative underway
- 20% reported having plans for a "low level of investment" for future allocation of resources or budget
- 63% of respondents indicated that they are not prepared enough, or at all, for increased use of genetic testing in their market.
Genomic medicine and how it influences longevity
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Peter Joshi
Chief Science Officer
Humanity Inc
Genomics

Challenge, opportunity, or hype?

Peter Joshi December 2021
Summary

• Massive fall in sequencing costs is driving
  • Scientific knowledge
  • Patient screening and therapies
  • Direct-to-consumer offerings

• Potential for health provider and insurance applications but
  • Difficult to sort the wheat from the chaff
  • Society’s acceptance and understanding is lagging
What’s changed?

Cost per Human Genome

- Falling costs
- New techniques
- More investment
- Application
- Basic Science

Moore's Law

NIH National Human Genome Research Institute
Nature AND Nurture
Nature and nurture

Proportion of variation attributed to DNA

- **Height**: 81% (High), 55% (Low)
- **BMI**: 65% (High), 29% (Low)
- **Education level**: 43% (High), 17% (Low)
- **Lifespan**: 15% (High), 7% (Low)
Applications
Drug discovery

GSK invests $300M into 23andMe as part of 4 year research partnership
Genetic risk prediction
Genetic risk prediction
Pre-implantation prediction

“a little girl named Aurea born by IVF in May 2020 …. the embryo from which she grew was selected from others based on polygenic screening before implantation, to optimise her health prospects”
Gene editing technologies, including CRISPR nuclease and base editors, will be tailored to individual targets.
Personalised prescribing
Genetics of Cilantro Aversion

Peter, you have slightly higher odds of disliking cilantro, based on your genetics.

Why would cilantro taste soapy?

Many people dislike cilantro (also known as coriander), describing the taste as "soapy." 23andMe researchers identified two genetic markers associated with this aversion. These genetic markers are located near genes that help determine your sense of smell through proteins called olfactory receptors. Some of these receptors detect aldehydes, chemical compounds that are found in soap and thought to be a major component of cilantro aroma.
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