

Julius Bär

INVESTING IN LONGEVITY

Mark Winterburn, Investment Advisory
London, 6th December 2018



This handout is being made available solely to those attending the presentation on 06 December 2018. It is intended for their personal use only and should not be copied or distributed further. Please find important legal information at the end of this document.

Signatory of:

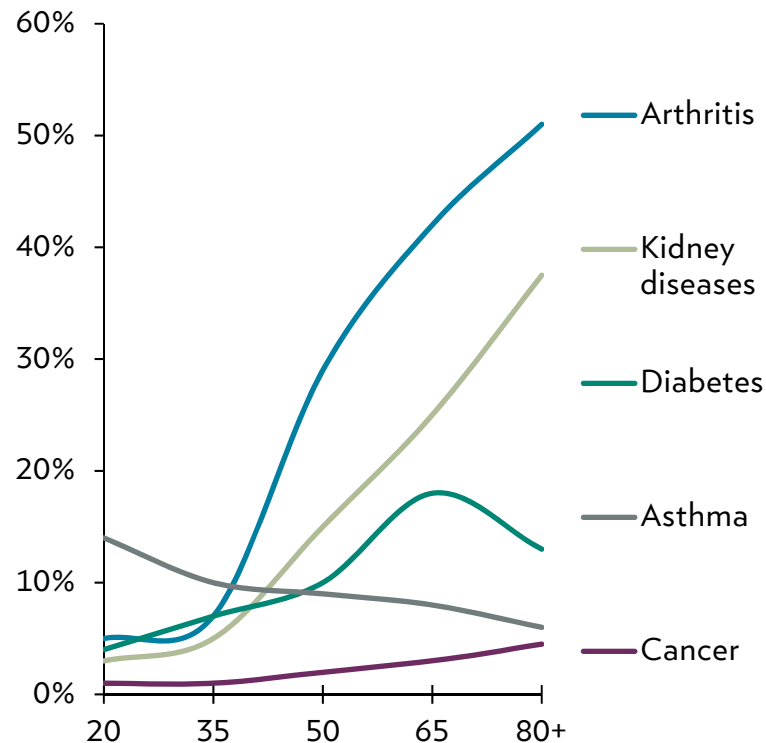


LONGEVITY: A CHALLENGE AND AN OPPORTUNITY

Some analysis of longevity concentrates on the rising financial burden of an aging population. It also offers opportunities.

The incidence of many chronic diseases rises rapidly with age

Incidence of disease by age (%)

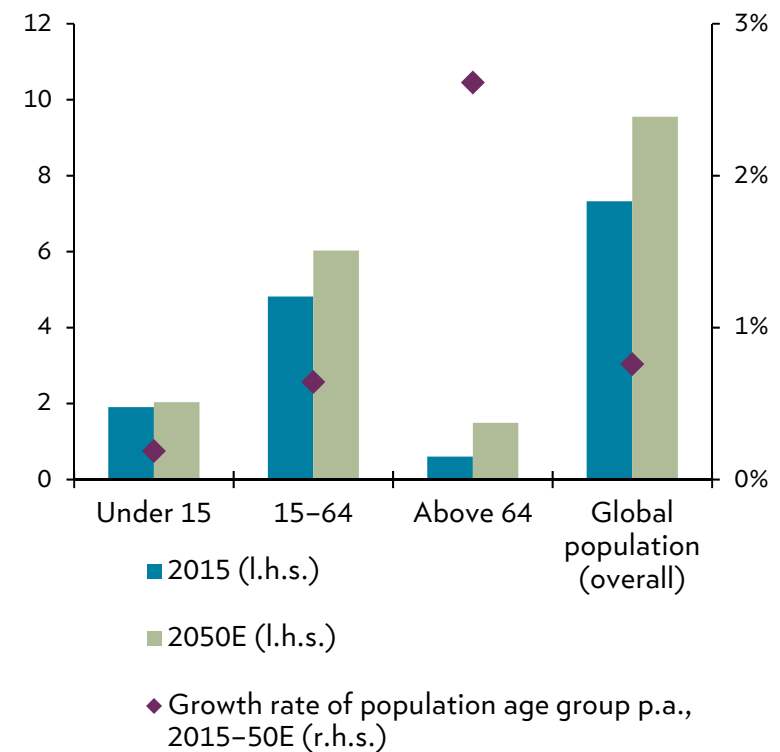


Source: World Bank, Julius Baer

The age group above 64 is the fastest growing

World pop. (bn)

Pop. growth rate p.a. (%)

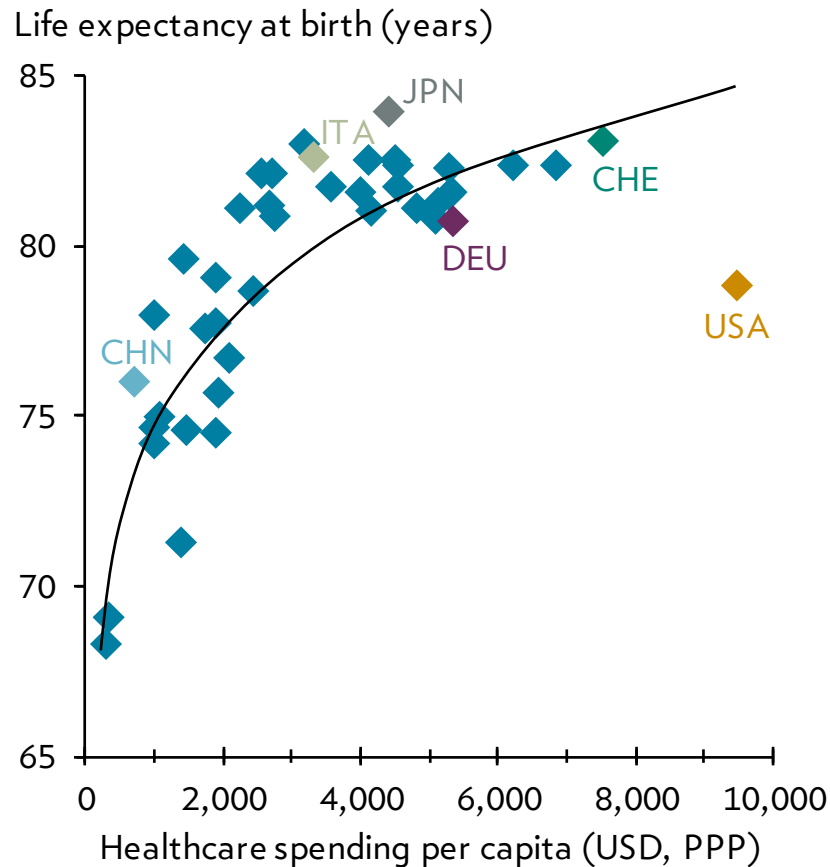


Source: World Bank, OECD, Centers for Disease Control and Prevention (CDC), Centers for Medicare and Medicaid Services (CMS), Julius Baer.

DIGITAL HEALTH: WHO PAYS WINS

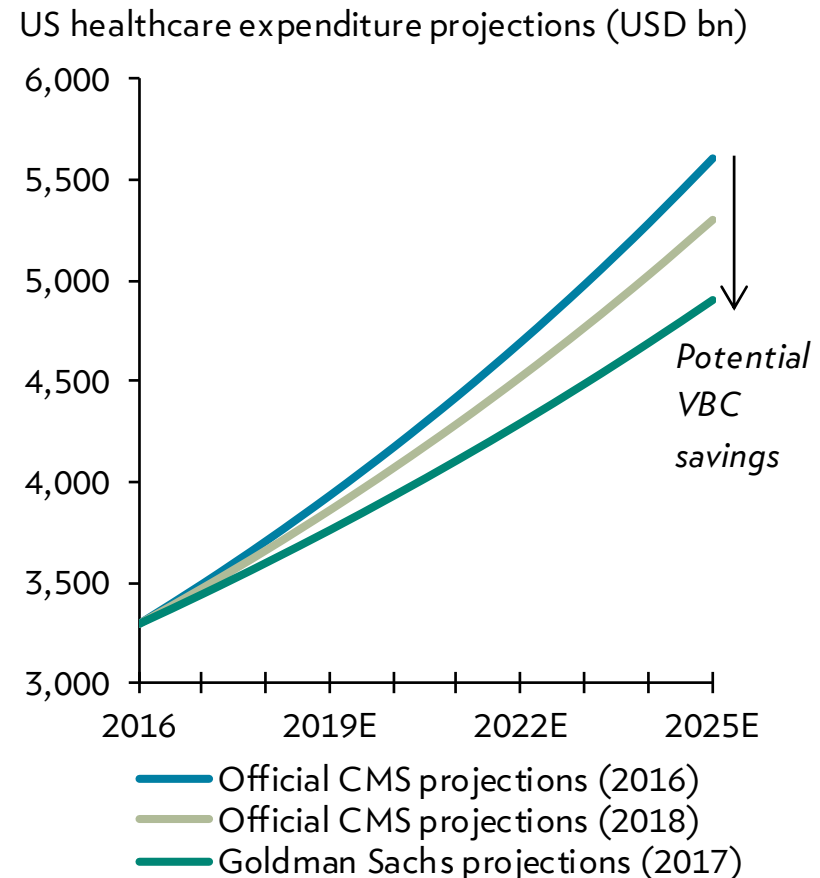
Health spending, especially in US, is becoming unaffordable; value-based care (VBC), enabled by digitalisation will shift more risk to providers.

US healthcare outcomes significantly below expectations relative to spending



Source: OECD, Julius Baer; **Note:** data as at 2015 or nearest available year; PPP = purchasing power parity, USA = United States, CHE = Switzerland, DEU = Germany, JPN = Japan, ITA = Italy, CHN = China

Value-based care, enabled by digital health solutions, could address health costs issue

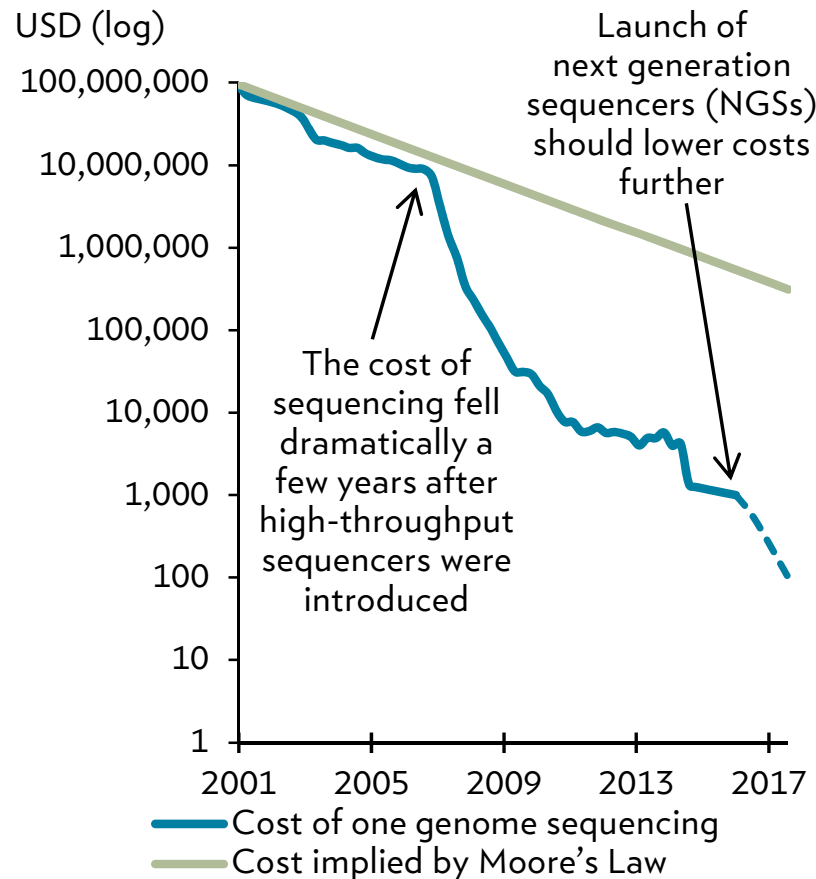


Source: Centers for Medicare and Medicaid Services (CMS), Goldman Sachs (GS), Julius Baer; **Note:** GS projections assume VBC-constrained US health spending growth to approximate US nominal GDP growth over 2016–2025E; E = estimate

GENOMICS 3.0

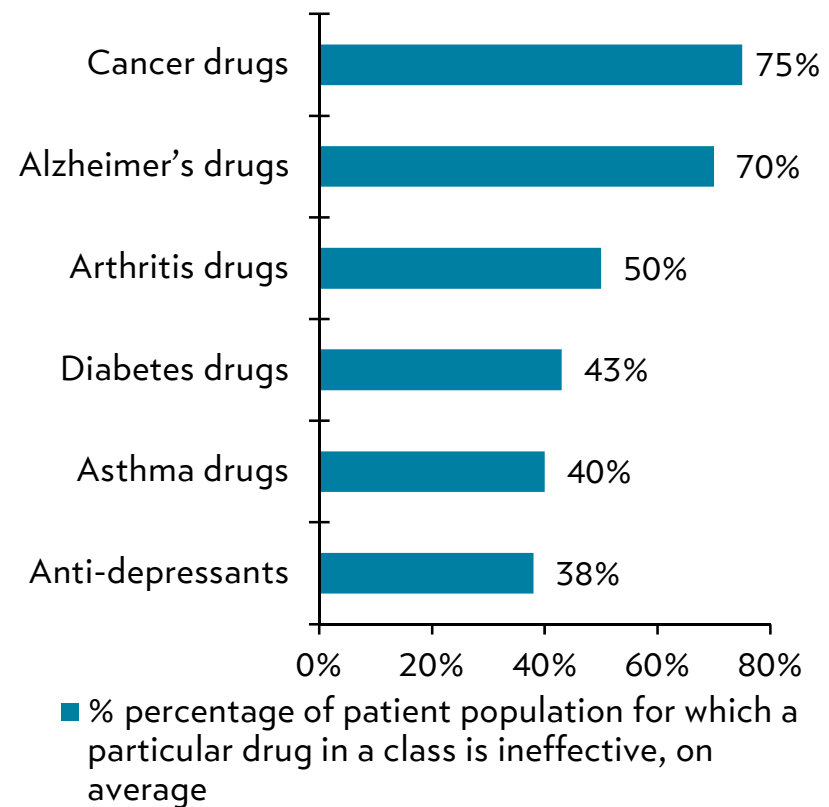
While genome sequencing costs have decreased beyond the expectations of the pioneers, the Big Data challenge (storage and analysis) is just as great an issue.

Defying the Law: sequencing costs declined beyond “normal” technological progress



Source: Human Genome Project, Julius Baer

The future of medicine lies in genetically tailored treatment

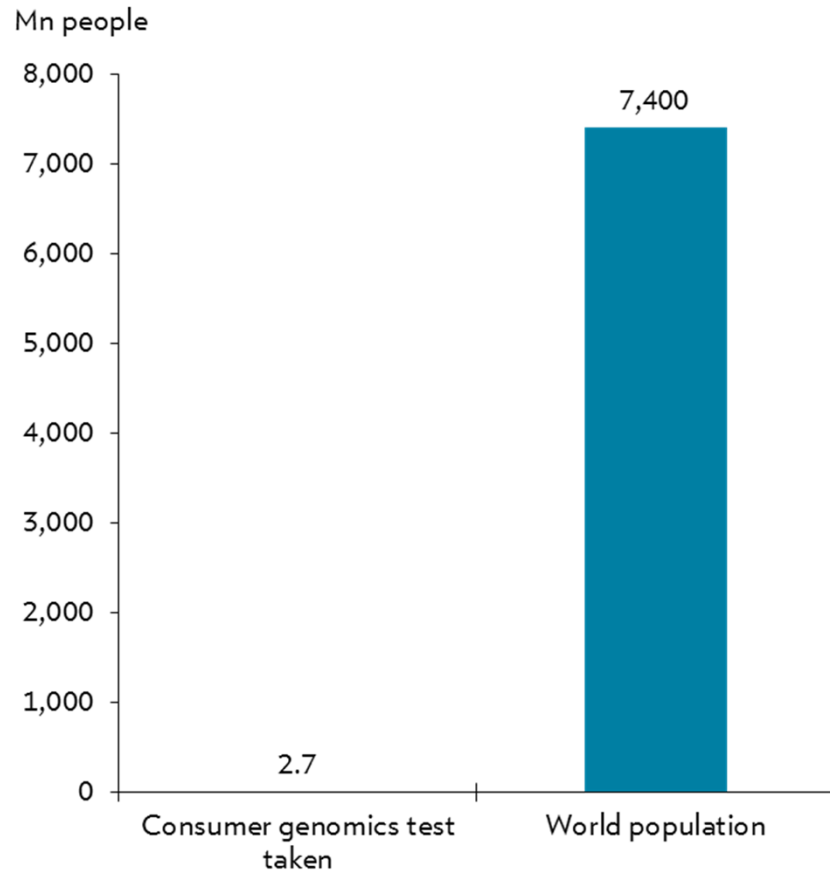


Source: Personalised Medicine Coalition, Julius Baer

AIMING FOR 8 BILLION SEQUENCED GENOMES

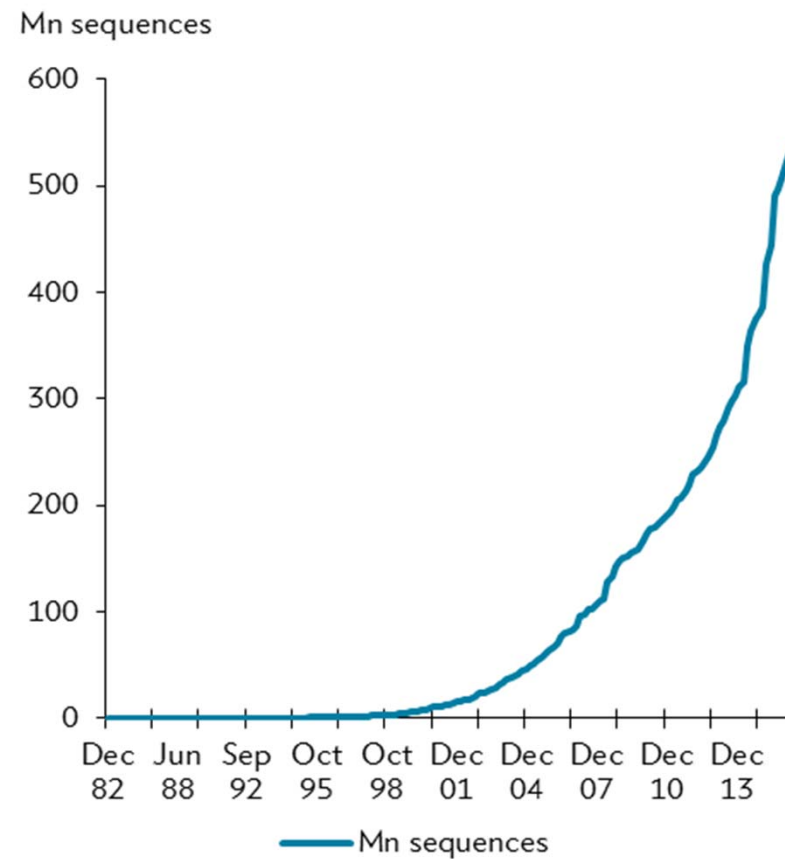
With 8–9 bn people set to populate the world by 2050, market potential for consumer genomics is enormous – will medicine or curiosity drive gene testing?

Huge room to grow: only 0.04% of humanity's genomes have been sequenced



Source: United Nations, UBS, Julius Baer; mn=million

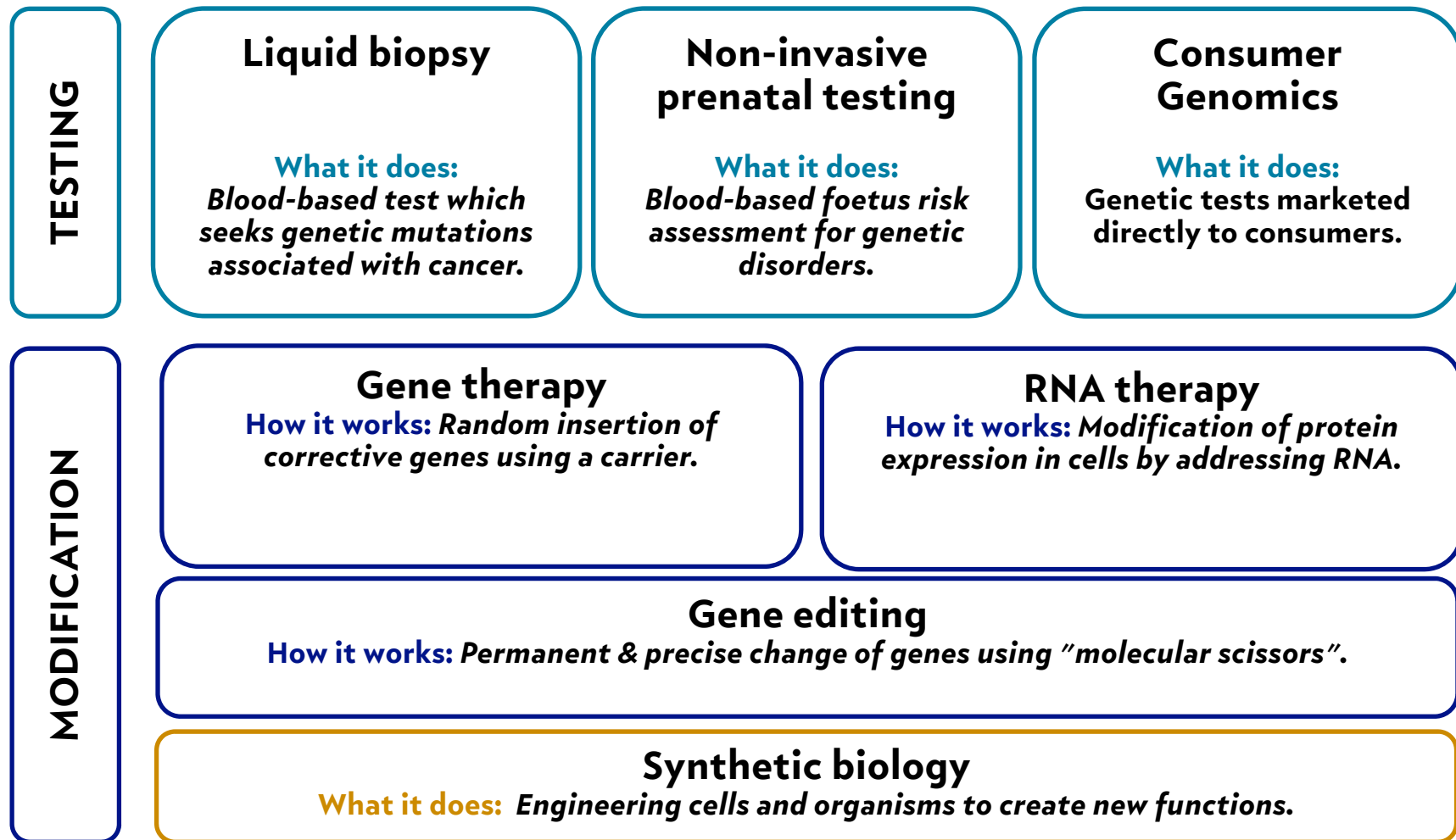
Accelerating: the number of sequenced organisms follows an exponential path



Source: National Center for Biotechnology Information (GenBank), Julius Baer; mn=million

GENOMICS 3.0 SEGMENTS EVOLVING

Genetic based testing segments are blossoming, as well as gene modification based therapies.



Source: Julius Baer

GENOMICS: AREAS OF INTEREST

We see opportunities in gene testing, gene modification and Contract Research Organisations (CROs).

- **Gene testing** - Recommend investors focus on firms that are exposed to the structural uptake in genome sequencing for both R&D and clinical purposes.
- **Gene modification** – Highly investable but investment risks are high and unpredictable. Therefore, we would recommend a diversified portfolio approach to investing in this space.
- **Contract Research Organisations (CROs)** - Use their expertise and scale in clinical services to conduct trials that would be inefficient or too costly for many biotech/pharma companies to afford on their own.

SOME CLOSING THOUGHTS

- Rudi Westendorp, Professor of Medicine at Old Age at the University of Copenhagen believes the first person to reach the age of 135 has already been born.
- According to Pew Research, in 1990 there were 91,000 people over 100 globally. In 2015, there were 451,000. By 2050, there will be almost 3.7 million.

IMPORTANT LEGAL INFORMATION (1/2)

This publication constitutes investment research and has been produced by Bank Julius Baer & Co. Ltd., Zurich, which is authorised and regulated by the Swiss Financial Market Supervisory Authority (FINMA). This publication series is issued regularly. Information on financial instruments and issuers will be updated irregularly or in response to important events.

General: The information and opinions expressed in this publication were produced as of the date of writing and are subject to change without notice. This publication is intended for information purposes only and does not constitute an offer or an invitation by, or on behalf of, Julius Baer to buy or sell any securities or related financial instruments or to participate in any particular trading strategy in any jurisdiction. Opinions and comments of the authors reflect their current views, but not necessarily of other Julius Baer entities or any other third party. Other Julius Baer entities may have issued, and may in the future issue, other publications that are inconsistent with, and reach different conclusions from, the information presented in this publication. Julius Baer assumes no obligation to ensure that such other publications are brought to the attention of any recipient of this publication.

Suitability: Investments in the asset classes mentioned in this publication may not be suitable for all recipients. This publication has been prepared without taking account of the objectives, financial situation or needs of any particular investor. Before entering into any transaction, investors should consider the suitability of the transaction to individual circumstances and objectives. Any investment or trading or other decision should only be made by the client after a thorough reading of the relevant product term sheet, subscription agreement, information memorandum, prospectus or other offering document relating to the issue of the securities or other financial instruments. This publication should not be read in isolation without reference to the full research report (if available) which may be provided upon request. Nothing in this publication constitutes investment, legal, accounting or tax advice, or a representation that any investment or strategy is suitable or appropriate to individual circumstances, or otherwise constitutes a personal recommendation to any specific investor. Any references to a particular tax treatment depend on the individual circumstances of each investor and may be subject to change in the future. Julius Baer recommends that investors independently assess, with a professional advisor, the specific financial risks as well as legal, regulatory, credit, tax and accounting consequences.

Information / forecasts referred to: Although the information and data herein are obtained from sources believed to be reliable, no representation is made that the information is accurate or complete. In particular, the information provided in this publication may not cover all material information on the financial instruments or issuers of such instruments. Bank Julius Baer & Co. Ltd., its subsidiaries and affiliated companies do not accept liability for any loss arising from the use of this publication. Important sources for the production of this publication are e.g. national and international media, information services (e.g. Thomson Reuters, Bloomberg Finance L.P.), publicly available databases, economic journals and newspapers (e.g. Financial Times, Wall Street Journal), publicly available company information, publications of rating agencies. Ratings and appraisals contained in this publication are clearly marked as such. All information and data used for this publication relate to past or present circumstances and may change at any time without prior notice. Statements contained in this publication regarding financial instruments or issuers of financial instruments relate to the time of the production of this publication. Such statements are based on a multitude of factors which are subject to continuous change. A statement contained in this publication may, thus, become inaccurate without this being published. Potential risk regarding statements and expectations expressed in this publication may result from issuer specific and general (e.g. political, economic, market, etc.) developments.

Risk: The price and value of, and income from investments in any asset class mentioned in this publication may fall as well as rise and investors may not get back the amount invested. Risks involved in any asset class mentioned in this publication may include but are not necessarily limited to market risks, credit risks, currency risks, political risks and economic risks. Investments in emerging markets are speculative and may be considerably more volatile than investments in established markets. **Past performance is not a reliable indicator of future results. Performance forecasts are not a reliable indicator of future performance. The Julius Baer fixed-income ratings apply exclusively to bonds of the specific issuer ranked senior unsecured or higher. They are therefore not valid for debentures junior to the mentioned ranking unless mentioned explicitly.** Particular risks in connection with specific investments featured in this publication are disclosed prominently hereinabove in the text of this publication. Any investment should only be made after a thorough reading of the current prospectuses and/or other documentation/information available. Entities within the Julius Baer Group provide advice which is not considered "independent" within the meaning given to that term by EU Directive 2014 / 65 / EU on markets in financial instruments (known as MiFID II).

Conflict of interest: We are required to disclose important information about our interests and potential conflicts. In order to prevent conflicts of interest from adversely affecting the interests of its clients, Julius Baer has implemented the necessary organisational and administrative arrangements to manage conflicts of interests. Julius Baer's arrangements include putting in place information barriers that ensure the separation of its research departments from other areas of the business so that no other area of the business will know the contents of any planned research until the research has been distributed to clients. Adherence to these procedures is monitored by the Julius Baer Compliance Department.

Unless explicitly stated in this publication, its information and analysis has not been disclosed to the issuer of the securities referred to herein or a Julius Baer entity before the publication has been published or disseminated. A Julius Baer entity may, to the extent permitted by law, participate or invest in other financing transactions with the issuer of the securities referred to herein, perform services or solicit business from such issuers, have a position or effect transactions in the securities or options thereof, have any other significant financial interest regarding the issuers of the securities referred to herein and/or may have done so in the past. For further information about our interest in the investments featured in this publication, see the company-specific disclosures above.

IMPORTANT LEGAL INFORMATION (2/2)

Important distribution information

This publication and any market data contained therein shall only be for the personal use of the intended recipient and shall not be redistributed to any third party, unless Julius Baer or the source of the relevant market data gives their approval. This publication is not directed to any person in any jurisdiction where (on the grounds of that person's nationality, residence or otherwise) such publications are prohibited.

External Asset Managers/External Financial Advisors: In case this research publication is provided to an External Asset Manager or an External Financial Advisor, Julius Baer expressly prohibits that it is redistributed by the External Asset Manager or the External Financial Advisor and is made available to their clients and/or third parties. By receiving any research publication the External Asset Managers or the External Financial Advisors confirm that they will make their own independent analysis and investment decisions, if applicable.

Guernsey: This publication is distributed by Bank Julius Baer & Co Ltd., Guernsey Branch, which is licensed in Guernsey to provide banking and investment services and is regulated by the Guernsey Financial Services Commission

United Kingdom (UK): Julius Baer International Limited, which is authorised and regulated by the Financial Conduct Authority (FCA), distributes this publication to its clients and potential clients. Rules made by the FCA for the protection of retail clients do not apply to services provided by members of the Julius Baer Group outside the UK, and the Financial Services Compensation Scheme will not apply. Julius Baer International Limited provides advice on a limited range of investment products (restricted advice).

United States: NEITHER THIS PUBLICATION NOR ANY COPY THEREOF MAY BE SENT, TAKEN INTO OR DISTRIBUTED IN THE UNITED STATES OR TO ANY US PERSON.

This publication may contain information obtained from third parties, including ratings from rating agencies such as Standard & Poor's, Moody's, Fitch and other similar rating agencies. Reproduction and distribution of third-party content in any form is prohibited except with the prior written permission of the related third party. Third-party content providers do not guarantee the accuracy, completeness, timeliness or availability of any information, including ratings, and are not responsible for any errors or omissions (negligent or otherwise), regardless of the cause, or for the results obtained from the use of such content. Third-party content providers give no express or implied warranties, including, but not limited to, any warranties of merchantability or fitness for a particular purpose or use. Third-party content providers shall not be liable for any direct, indirect, incidental, exemplary, compensatory, punitive, special or consequential damages, costs, expenses, legal fees or losses (including lost income or profits and opportunity costs) in connection with any use of their content, including ratings. Credit ratings are statements of opinions and are not statements of fact or recommendations to purchase, hold or sell securities. They do not address the market value of securities or the suitability of securities for investment purposes and should not be relied on as investment advice.

© Julius Baer Group, 2018