

## Elevator Pitches Event 4

Delegates at Avicenna Event 4 were asked to come up with 'elevator pitches' - short summaries used to quickly and simply define a concept and its value proposition.

Here are some of the collected pitches in their original language, and translated into English where necessary.

### Original

- 1 L'ambition des essais cliniques *in silico* est de rassembler l'ensemble de connaissances hétérogènes dans des modèles numériques pour créer plusieurs milliers de patients virtuels, permettant ainsi de tester de nouveaux traitements plus rapidement. Les traitements sont ainsi rendus accessibles aux patients de façon plus rapide, moins onéreuse et plus sûrs.  
A plus long terme, chaque patient disposera d'un modèle numérique personnalisé qui rends ainsi capable une adaptation de son traitement selon sa physiologie et d'en augmenter l'efficacité préventive.
2. 1 : Definition de *in silico*  
En utilisant les méthodes numériques, l'approche in-silico vise à améliorer la pertinence de la décision en Santé publique et individuelle.  
2 : Médecine personnalisée  
En particulier, cette aide à la décision concerne le patient et son médecin en permettant à ce dernier d'optimiser le choix thérapeutique en tenant mieux compte des caractéristiques et besoin des patients.  
3 : R&D  
Elle vise aussi à rendre l'innovation, le développement et la mise sur le marché de nouvelles thérapeutiques plus efficient
- 3 La rappresentazione virtuale dello stato di salute di un individuo aiuta la ricerca per lo sviluppo degli strumenti usati in medicina per diagnosi e cura e permette di migliorare le prestazioni dei servizi sanitari, riducendone tempi e costi. Gli studi clinici condotti su un grande numero di pazienti, resi possibili dai recenti progressi informatici, miglioreranno le prestazioni dei servizi sanitari e potranno ridurre i tempi e i costi di sviluppo.
- 4 Per la cura del tuo bambino lasciamo che a sbagliare tante volte sia il computer piuttosto che una volta sola il tuo pediatra.

### Translation

- ISCT ambition is to synthesize heterogeneous knowledge within computational models describing thousands of patients, in order to test new treatments more quickly. The consequence for all citizens will be faster access to cheaper and safer medical treatments.  
In the longer term, a digital version of each patient could be made available to customize their treatment to the patient physiology and increase the treatment's preventive efficacy.
1. With the help of numerical techniques, the in-silico approach aims at improving the relevance of decision making in both public and individual Health
  2. This contribution concerns the patient and his practitioner, by supporting the later in optimizing the therapeutic choice by better accounting for the patient's characteristics and needs
  3. It also has ambitions to make innovation, development and marketing of new medical products more efficient.
- A virtual representation of the medical status of an individual helps the research for the development of tools for diagnosis and treatment and allows the improvement of healthcare system performances, while reducing timing and costs. Clinical trials on a large number of patients, made possible by recent computer advances, will improve healthcare system performances and will help to reduce development time and costs.
- For the treatment of your child it's better if the computer fails many times rather than your paediatrician fails once.

5 *Een nieuwe fase voor klinische studies.*

Klinische studies worden uitgevoerd om de veiligheid, werking en effectiviteit van nieuwe medicijnen en medische implantaten vast te stellen. Deze studies worden uitgevoerd op speciaal geselecteerde groepen patiënten, maar deze groepen vertegenwoordigen bij lange na niet de gehele patiëntpopulatie.

In silico klinische studies zijn gedigitaliseerde klinische studies die alle denkbare patiënten in digitale vorm zal bevatten. Het zal de wetenschappers en de ontwikkelaars helpen bij het ontwerpen en testen van nieuwe behandelmethoden en zal conventionele klinische studies en dierstudies verfijnen, verminderen en soms zelfs vervangen. Kortom, uw specifieke digitale evenbeeld zal u vertegenwoordigen bij het bepalen van de – voor u – meest optimale behandeling op het juiste moment.

6 Wie kann man den Begriff *In Silico* Medizin am besten in einfachen Worten beschreiben?

Wer ist die Tatsächliche Zielgruppe? – Wähler? Politiker? Die Europäische Kommission? Ärzte?

Was ist Zielsetzung? – Das Schreiben von Zeitungsartikeln? „Presse Mappe“ / Portfolio?

Menschen kommen in verschiedenen Größen; für die Meisten sind Kleider von der Stange eine kostengünstige und von der Passform her eine zufriedenstellende Variante. Es gibt jedoch auch eine Gruppe von Menschen, die auch heute noch - zum Beispiel aus anatomischen Gründen - zum Massschneider gehen muss.

In der Medizin werden heutzutage neue Therapien durch zeitaufwendige und teure klinische Studien beurteilt. Die Berücksichtigung individueller Bedürfnisse bleibt beim Umfang einiger 100 Teilnehmern oft auf der Strecke. Der massive Einsatz von Computersimulationen in *In Silico* Medizin jedoch erlaubt die Umsetzung individueller Therapieformen in einem bisher nicht bekannten Ausmass.

Speziell Patienten mit seltenen, chronischen Erkrankungen leiden unter lückenhafter Forschung, da klassische klinische Studien nicht machbar sind. Am Computer

*A new phase in clinical trials/adding a new phase to clinical trials*

Clinical trial studies are performed to assess and prove the safety, performance, and efficacy of new treatment methods. The studies are executed on carefully selected groups of patients, but by far do not represent all the anatomical and physiological variations of the entire population. In silico clinical trials are computerised clinical studies on virtual representations of all patients conceivable. This means that also every individual patient; i.e. a tailor-made digital version of you, is part of the study group. This will help to design new and better drugs and implants and will reduce, refine, and even replace conventional clinical trial studies and animal studies. It will help to determine which treatment and treatment timing will be most effective for you, specifically you.

People come in all different sizes. For most of us buying off the rack clothing provides a cost-effective, suitable and comfortable alternative. However, there are also people who - for anatomical reasons for example - have to get bespoke tailored clothing.

The same holds true for medicine. In medicine today, new therapies are usually validated by time-consuming and expensive clinical trials. Consideration of individual requirements and characteristics is often not feasible with test groups of some hundred participants or less. The relatively new use of computer simulations for the clinical trials process, however, allows for the investigation of individual therapy forms, having an unprecedented impact on the future of the clinical trials process.

Patients with rare, chronic diseases, for example, suffer due to the constraints in research which make classical clinical trials unfeasible. On the computer, in the virtual environment, such constraints can be overcome with the promise of a relief of symptoms or cure. This is possible for the steps from analysis,

durchgefuehrte klinische Studien versprechen Erleichterung der Beschwerden oder Heilung – dies gilt für Schritte von Analyse, zur Mechanismus Identifizierung bis zum Therapieansatz. Die massiven Fortschritte im Bereich der Computerwissenschaften (Hard- und Software), Klinischen Bildgebung, und Diagnoseverfahren ermöglichen die Realisierung dieser radikalen neuen Ansätze in der Medizin.

to mechanism identification and therapeutic approach. The significant progress made in the field of computer science (hardware and software), clinical imaging, and diagnostic procedures enable the realisation of these radical new approaches in medicine.

- 7 Currently, many medicines are tested in animals. ISCTs offer an opportunity to assess the safety and effectiveness of a new medicine in a human virtual twin of a real patient.
- 8 Combinatorial explosion: 15 drugs can be used in 32000 combinations  
Only *in silico* predictions can give results within your lifespan if best personalised combination of up to 15 approved drugs has to be found!
- 9 The human body, healthy or ill, is very complicated to understand. We need to understand the human body to be able to adequately identify and treat illnesses. Technological advances can be used to develop new treatments. Imagine a digitized version of an ill you. We compare your digitized person with other similar digitized persons who share your characteristics, such as height, weight, gender, ethnicity, etc. We will use a tried and tested computer analysis to development new treatments. This system is called *in silico* clinical trials. *In silico* clinical trials have the potential to decrease the time required to develop new personalized treatments.
- 10 “Big data has often been referred to as the new “black gold”. However just as crude oil is useless to its users in its raw unprocessed form, so too is big data useless when unprocessed. *In silico* medicine is the computer processor that transforms big data into actionable information useable by doctors, patients and researchers to enable truly personalised medicine.”
- 11 “VPH brings together researchers from what are traditionally separate sciences, engineering, computer programming, systems biology and all forms of medicine. The objective is to create virtual models to enable the investigation of the human body as a single complex system.”
- 12 “Over the last number of years the European Commission has invested a lot of political capital in the concept of personalised medicine. The words ‘the right treatment for the right patient and the right time’ have been heard time and time again.  
It is through VPH that we will find out what the right treatment is, what constitutes the right patient, when is the right time.”
- 13 “*In silico* medicine, the integration of computer models in healthcare, has the potential to reduce the cost of clinical trials, reduce the need for animal testing and reflect the individuality of each patient by creating treatments tailored to their individual needs.”
- 14 The collision of the digital age with healthcare has led to *in silico* models so advanced that they are redefining what we mean by modern medicine.
- 15 *In silico* medicine is the bridge between big data and personalised medicine, turning data into actionable information with better results for patients.
- 16 VPH is the “google translate” for medical data, taking colossal quantities of recorded data and processing it into outcomes and findings understandable by any doctor.

- 17 Support for VPH is not the support for one niche science, it is support for a tool that will make sense of science itself.
- 18 Support for *in silico* medicine means further the goal of reducing animal testing while preserving the medical and scientific necessity of reliability of health data.
- 19 VPH – Making medicine modern.
- 20 With the help of numerical techniques, the in-silico approach aims at improving the relevance of decision making in both public and individual Health.
- 21 This contribution concerns the patient and his practitioner, by supporting the later in optimizing the therapeutic choice by better accounting for the patient's characteristics and needs.
- 22 It also targets to make innovation, development and marketing of new medical products more efficient.