



# HEALSPHERE

STANDARDIZED REPORTING FOR PHARMACEUTICAL  
ADVERSE EFFECTS IN CLINICAL SETTING

HEALTH HACKATHON - THE MAKING OF AN INNOVATIVE MEDICINE  
PRESENTED BY *NIKITA NORKIN, TIMOTHÉE FERRARI AND SIMON CROUZET*

# Adverse Drug Reactions (ADR)

2 mio patients

>130 bio \$/year

Preventable



2 / 5

Review

## The economic burden of preventable adverse drug reactions: a systematic review of observational studies

D Formica , J Sultana, PM Cutroneo, S Lucchesi, R Angelica, S Crisafulli, ...show all

Pages 681-695 | Received 20 Mar 2018, Accepted 18 Jun 2018, Published online: 03 Jul 2018

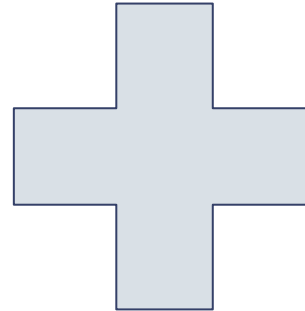
 Cite this article

 <https://doi.org/10.1080/14740338.2018.1491547>

 Check for updates



# Drug-Drug Interactions



[Home](#) > [European Journal of Clinical Pharmacology](#) > [Article](#)

## Interaction between acetaminophen and warfarin in adults receiving long-term oral anticoagulants: a randomized controlled trial

Short Communication | [Published: 30 December 2010](#)

Volume 67, pages 309–314, (2011) [Cite this article](#)

# *HealSphere - Universal Platform to report adverse effects*

Simple & Free



Patient-centered



Transparent



Accessible Public Adherence

Available on mobile and web browser



# HealSphere - a Universal Platform to report adverse effects

... *Adaptative*

Two report modalities



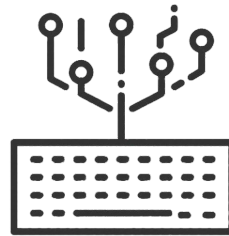
Patient

*Self-reporting of symptoms*  
*Adjusted weight*  
*Extensive profile descriptors*

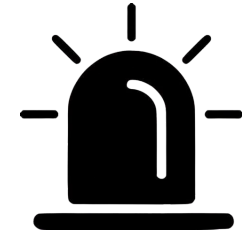
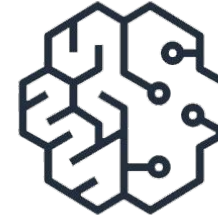
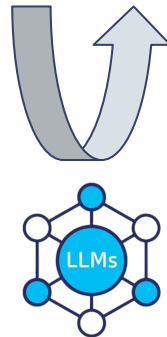


Clinician

*Patient opt-in*  
*Increased weight*



*Formatted input*  
*Free text*



Monitoring



Analytics

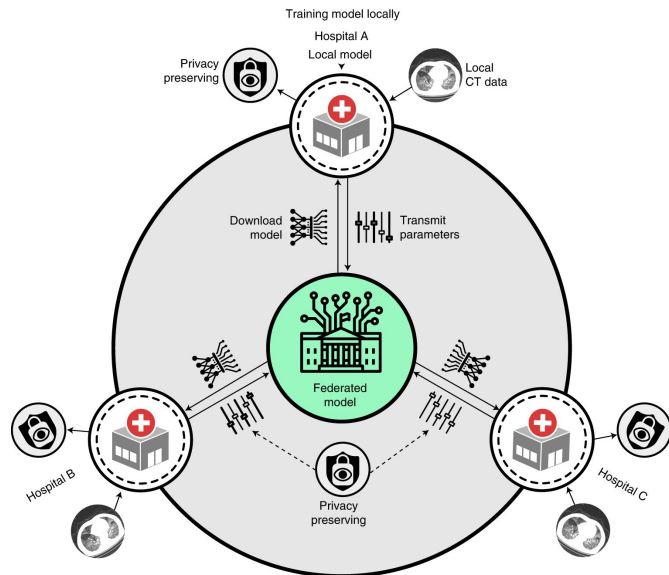


# *HealSphere - a Universal Platform to report adverse effects*

## *... Respectful*

### Federated Model

*Decentralizing patient's data*



*Adapted from Bai et al. (Nature Machine Intelligence 2021)*

### Sparse Model

*Accepting patient's privacy*



# *HealSphere - a Universal Platform to report adverse effects*

## *... Inclusive*

*Accessible all around the world*

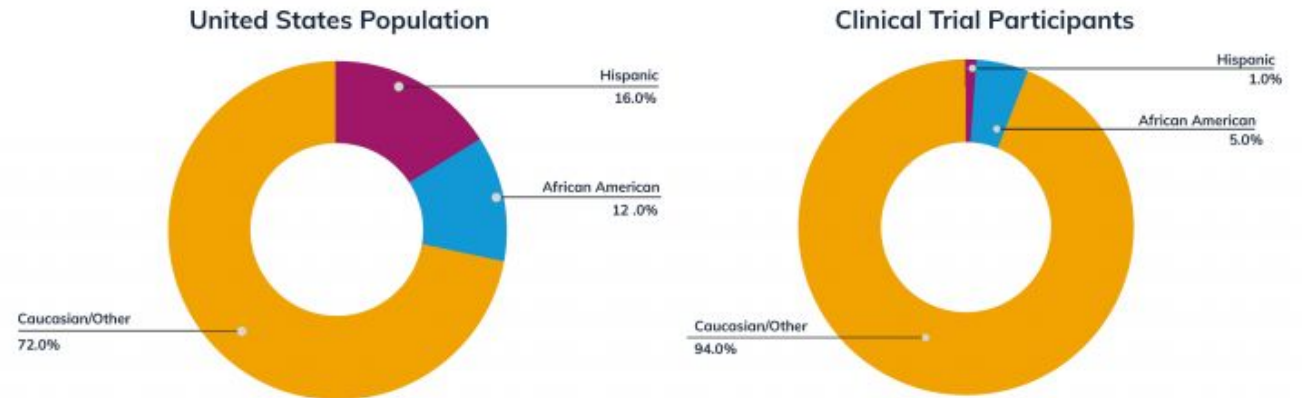


*Analytics to orient  
research effort*



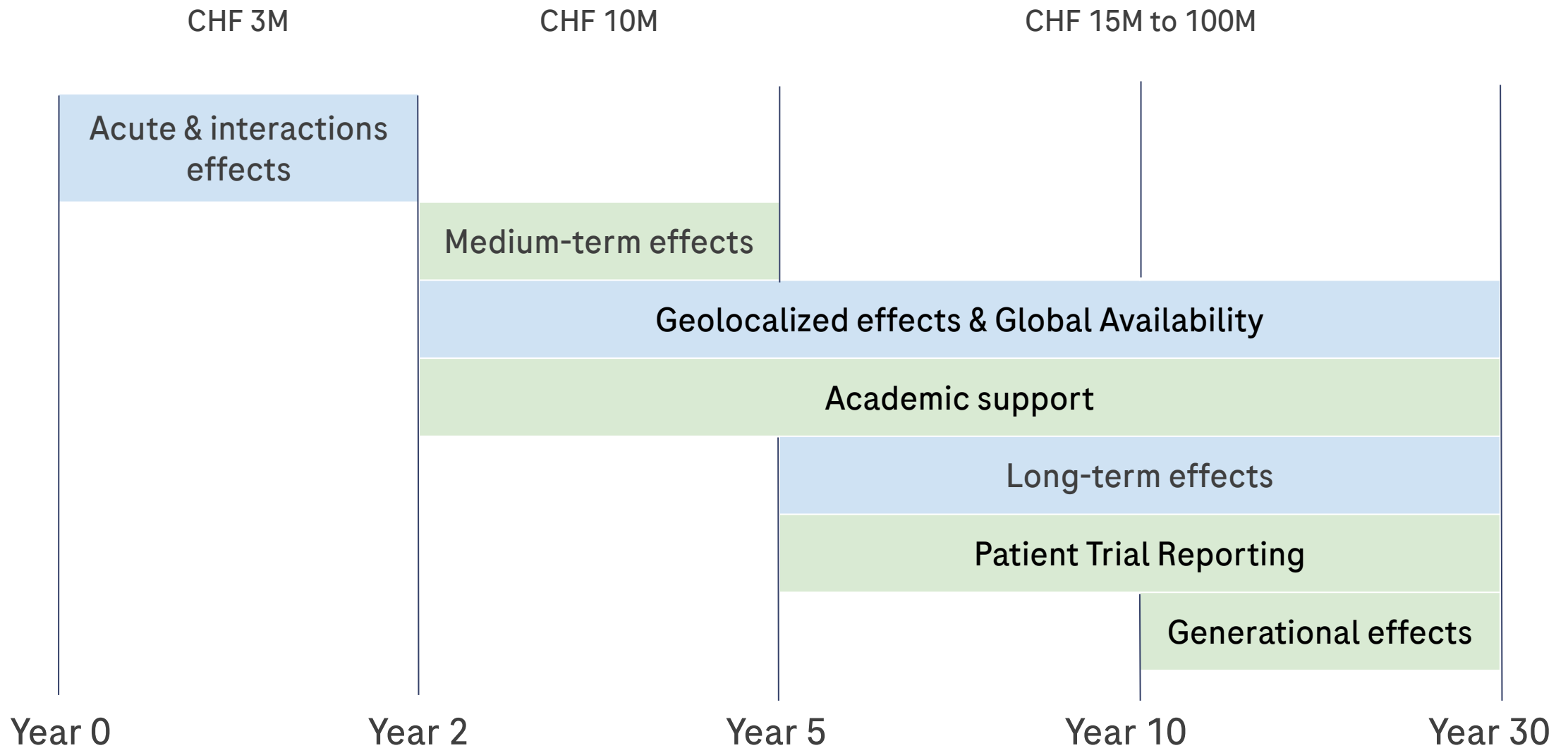
*Provide insights on population under-represented in clinical trials*

## Underrepresentation in Clinical Trials



*\*Sourced from <https://www.sciencedirect.com/science/article/pii/S0146280618301889>*

# Timeline





# Business Plan

## The Team

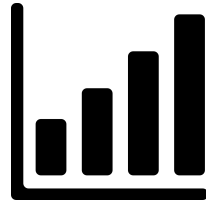


Pharmacologists

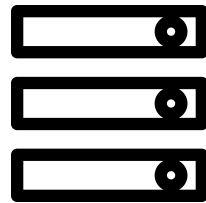


Software  
Engineers

CHF 3M p.a.



Marketing



Infrastructure

CHF 1M p.a.

## The Clients



Public  
Healthcare

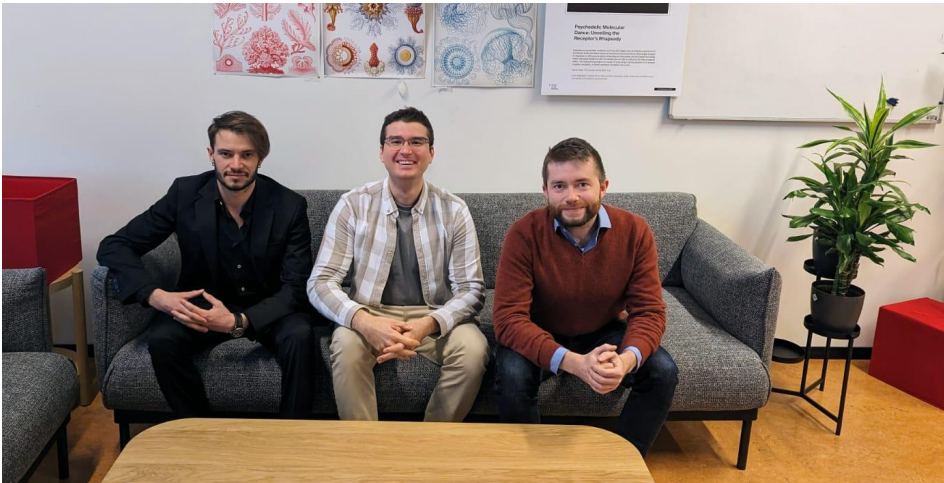


Private  
Physicians

*Let's prevent together the next big tragedy!*



The HealSphere Team



## Potential Investors & Funding Sources

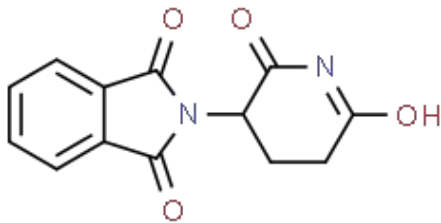




# Thalidomide Tragedy

- Widely used in 1950s - 1960s for the treatment of nausea in pregnant women
- Exhibited embryotoxicity
- Around 10000 children worldwide affected
- Banned in most countries after the effects were discovered
- In USA the FDA refused the approval to market thanks to **Dr. Frances Kathleen Oldham Kelsey**
- Later repurposed to treat leprosy and myeloma

Chemical Structure of  
Thalidomide



<https://www.chemspider.com/Chemical-Structure.5233.html>



President John F. Kennedy gave Dr. Frances Oldham Kelsey the nation's highest federal civilian service award in 1962, saying she had "prevented a major tragedy of birth deformities."

Credit: The White House

<https://www.nytimes.com/2015/08/08/science/frances-oldham-kelsey-fda-doctor-who-exposed-danger-of-thalidomide-dies-at-101.html>