

# IMPACT – A generic framework for simulating public health policy

- A single framework for domain experts to collaborate on policy model design and validation
- Decision support capability that enables health professionals to explore ‘what-if’ policy scenarios

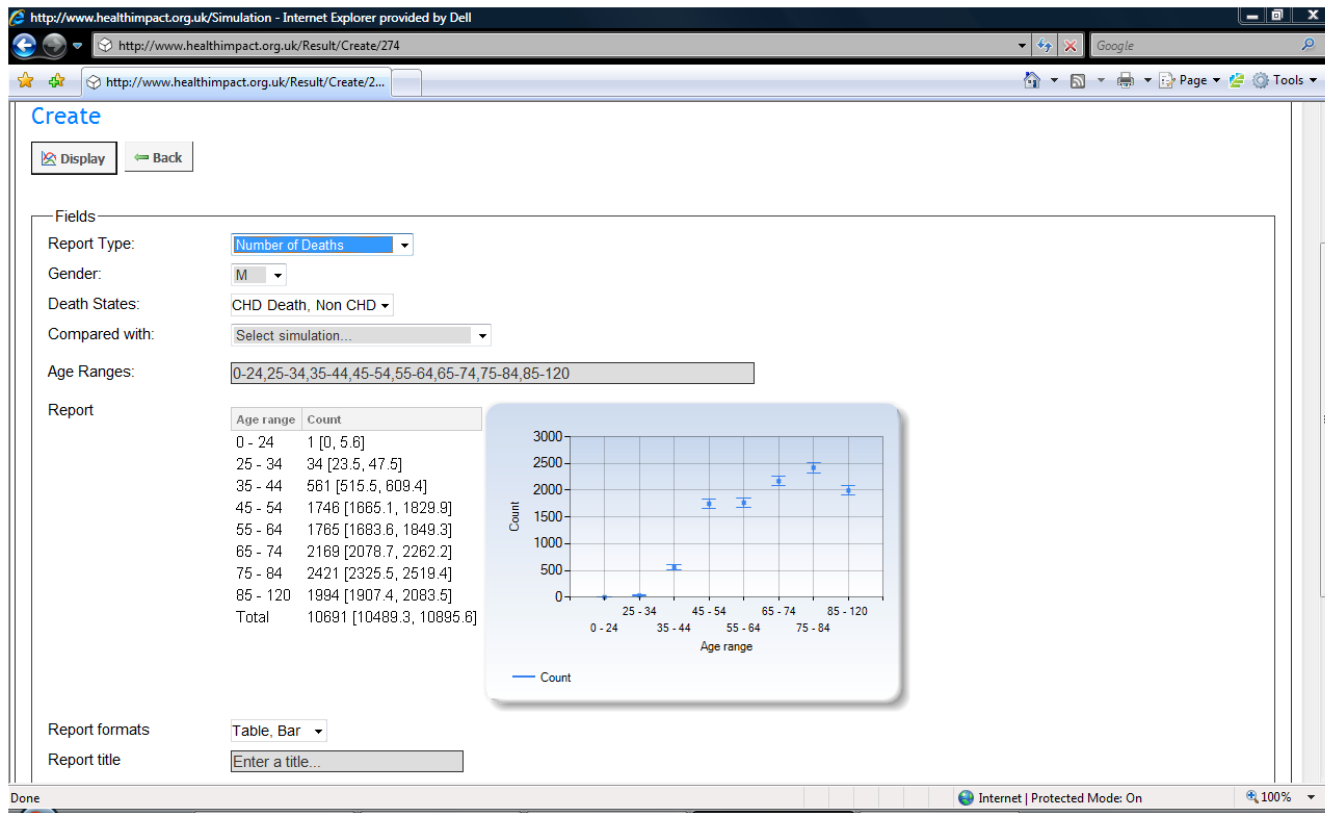
<http://www.healthimpact.org.uk>

# Population Simulator

- Simulates effects of population level interventions on mortality and disease incidence
- 'Stock of Health' is a key concept
- Two models: England and Wales CHD mortality and incidence
- Five risk factors
  - SBP, BMI, cholesterol, smoking, diabetes
- Data sources:
  - Office of National Statistics, Health Survey for England, US Lifetime Risk Pooled Cohorts, GPRD, Prospective Studies Collaboration published data.
- Developed for execution on parallel architectures for fast simulation
  - Multi-core CPUs, Graphics processing units
- Mortality model can be calibrated to closely match:
  - ONS CHD mortality data (1993 – 2010)
  - Hazard ratios for risk factor shifts

# Clinical Simulator

- Simulates the effects of clinical interventions on disease progression, mortality
- Graphical model
- Interventions are characterised by:
  - Relative risks
  - Uptakes (availability and adherence)
- England and Wales CHD mortality model
  - 8 states, 20 interventions
- Data sources:
  - Treatment effect sizes from systematic reviews
  - Uptake levels from GPRD, local audits and published surveys
- Calibrated against transition probabilities (estimated from literature and derived from SLIDE)
- Validated against the Scottish SLIDE AMI sub-cohort
  - Good match to mortality age distributions for males and females



# Interfaces

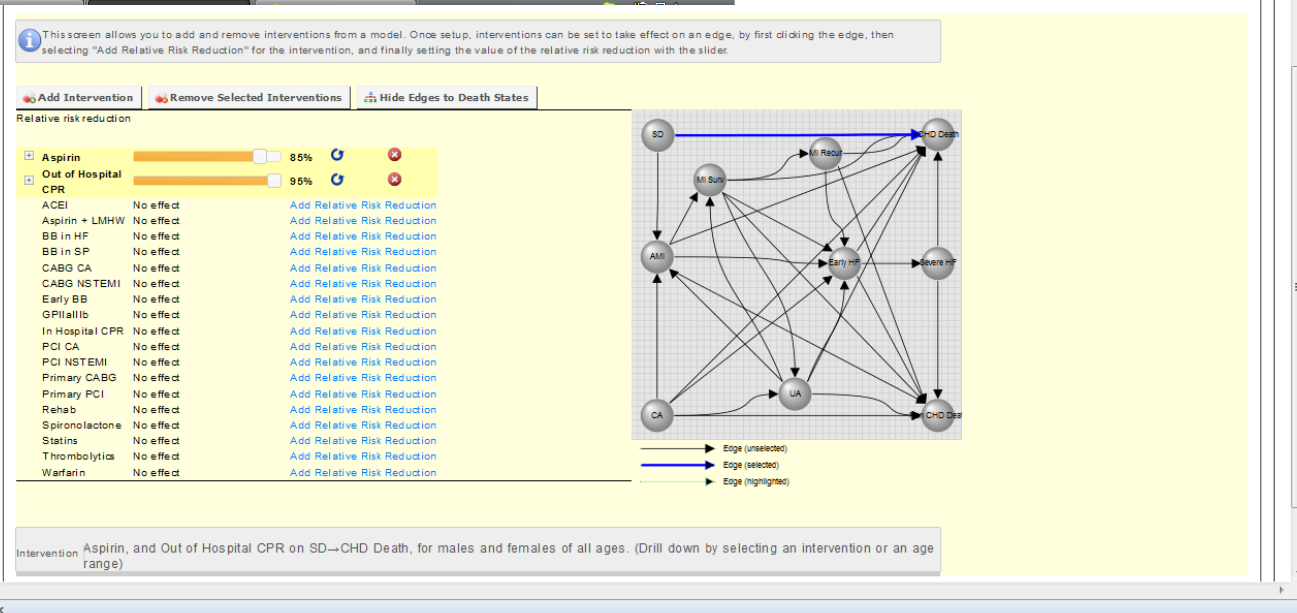
## Collaboration

Different views for different types of user

Metadata for provenance

## Tools

- Model design
- Model calibration
- Simulation execution
- Statistical analysis
- Model validation



# Future

- User engagement
  - Trials, interviews
- Integration of tools for a ‘unified’ model
  - Disease incidence, progression and mortality
- Calibration and validation
  - Clinical model interventions
- Health economics
- Links with existing collaboration frameworks
  - Developing an information management approach to use of e-Labs