Having just returned from the American Diabetes Association Scientific Sessions in Orlando, I moderated a news conference on the cost-effectiveness of intensive cardiovascular disease (CVD) risk factor management in patients with type 2 diabetes. Aggressive control of glycemia, blood pressure, lipids and implementation of a heart-healthy lifestyle not only reduced the number of CVD events by ~50% but was cost effective over a 20-year interval compared with conventional management. A question then follows is how effective is this in other regions of the world and health care systems for CVD prevention in general? The National Health Service Health Check Program in Liverpool England provides an example with a conclusion that there remains much left to be accomplished.


Abstract

BACKGROUND:

Aiming to contribute to prevention of cardiovascular disease (CVD), the National Health Service (NHS) Health Check programme has been implemented across England since 2009. The programme involves cardiovascular risk stratification-at 5-year intervals-of all adults between the ages of 40 and 74 years, excluding any with preexisting vascular conditions (including CVD, diabetes mellitus, and hypertension, among others), and offers treatment to those at high risk. However, the cost-effectiveness and equity of population CVD screening is contested. This study aimed to determine whether the NHS Health Check programme is cost-effective and equitable in a city with high levels of deprivation and CVD.

METHODS AND FINDINGS:

IMPACTNCD is a dynamic stochastic microsimulation policy model, calibrated to Liverpool demographics, risk factor exposure, and CVD epidemiology. Using local and national data, as well as drawing on health and social care disease costs and health-state utilities, we modelled 5 scenarios from 2017 to 2040: Scenario (A): continuing current implementation of NHS Health Check;Scenario (B): implementation 'targeted' toward areas in the most deprived quintile with increased coverage and uptake;Scenario (C): 'optimal' implementation assuming optimal coverage, uptake, treatment, and lifestyle change;Scenario (D): scenario A combined with structural population-wide interventions targeting unhealthy diet and smoking;Scenario (E): scenario B combined with the structural interventions as above. We compared all scenarios with a counterfactual of no-NHS Health Check. Compared with no-NHS Health Check, the model estimated cumulative incremental cost-effectiveness ratio (ICER) (discounted £/quality-adjusted life year [QALY]) to be 11,000 (95% uncertainty interval [UL] -270,000 to 320,000) for scenario A, 1,500 (-91,000 to 100,000) for scenario B, -2,400 (-6,500 to 5,700) for scenario C, -5,100 (-7,400 to -3,200) for scenario D, and -5,000 (-7,400 to -3,100) for scenario E. Overall, scenario A is unlikely to become cost-effective or equitable, and scenario B is likely to become cost-effective by 2040 and equitable by 2039. Scenario C is likely to become cost-effective by 2030 and cost-saving by 2040. Scenarios D and E are likely to be cost-saving by 2021 and 2023, respectively, and equitable by 2025. The main limitation of the analysis is that we explicitly modelled CVD and diabetes mellitus only.
CONCLUSIONS:

According to our analysis of the situation in Liverpool, current NHS Health Check implementation appears neither equitable nor cost-effective. Optimal implementation is likely to be cost-saving but not equitable, while targeted implementation is likely to be both. Adding structural policies targeting cardiovascular risk factors could substantially improve equity and generate cost savings.

RESEARCH CORNER

My group uses single-particle electron microscopy (cryo-EM) to determine the structures of large macromolecular complexes involved in various fundamental cellular processes. We combine structural information from cryo-EM with biochemical and functional data to elucidate the basic molecular mechanisms employed by complexes involved in regulation of gene expression and chromatin architecture, and DNA replication. I am particularly interested in understanding how the structure, conformational dynamics and interactions between macromolecular complexes enable their function.

A primary focus of our research is the Mediator co-activator complex. The realization that, in general, activators and repressors do not interact directly with components of the basal transcription machinery, led to the discovery of coactivator complexes that function as interfaces to integrate and convey regulatory information. Mediator was first discovered in the yeast S. cerevisiae, but was later found to be present and essential for control of gene expression in all eukaryotic organisms. Because disruption of gene expression regulation by Mediator is directly linked to developmental disorders and many forms of cancer, understanding how Mediator works could ultimately have major public health implications. We used EM to generate the first 3D maps of yeast, mouse and human Mediators, and showed that their structure and organization are generally conserved. Recent developments in cryo-EM hardware and image analysis software have allowed us to map the location of most Mediator subunits (Mediator includes 25-30 different proteins) and to describe at near-atomic resolution the structure of Mediator and its interaction with RNA polymerase II, the enzyme responsible for transcription of all protein-coding genes. A state-of-the-art cryo-EM facility recently-established on the Anschutz Medical School will allow us to pursue structural analysis of other essential cellular machines and offers a unique opportunity for researchers across campus to apply this new, revolutionary technique to advance their own research.

Institutional Gift Policy

A new institutional gift policy entitled External Gift Management and Institutional Integrity goes into effect July 1, 2018. The policy is designed to support faculty, senior leaders, and the University by providing a structured process for the ethical review of gifts to the University that might pose a threat to institutional integrity. This policy does not apply to individual faculty conflicts of interest or grants, which include the conduct of human subjects research.

Please click the following link to review the policy: External Gift Management and Institutional Integrity. The online Gift Review and Attestation Form should be completed for gifts subject to the policy and can be accessed at: https://redcap.ucdenver.edu/surveys/?s=TJN8RXECCN.

GRANTS MANAGEMENT SYSTEM CHANGES

Funding/Spending Grants Management

CU is implementing automated funding/spending controls on October 22, 2018, based on project end dates and status (fund 30/31 sponsored and fund 35 projects). The configuration impacts all campuses university-wide and enables spending controls to ensure compliance with federal and sponsor requirements after the project ends. The Office of Grants and Contracts is working with the School/College Administrators on this upcoming change.

This change will have a substantial impact on campus business practices and will offer better systematic control over expenditures incurred beyond the end date. These include payroll, subcontract, core lab services and other purchasing and travel expenditures.

Questions? Contact Amy Gannon @ Amy.Gannon@ucdenver.edu.