



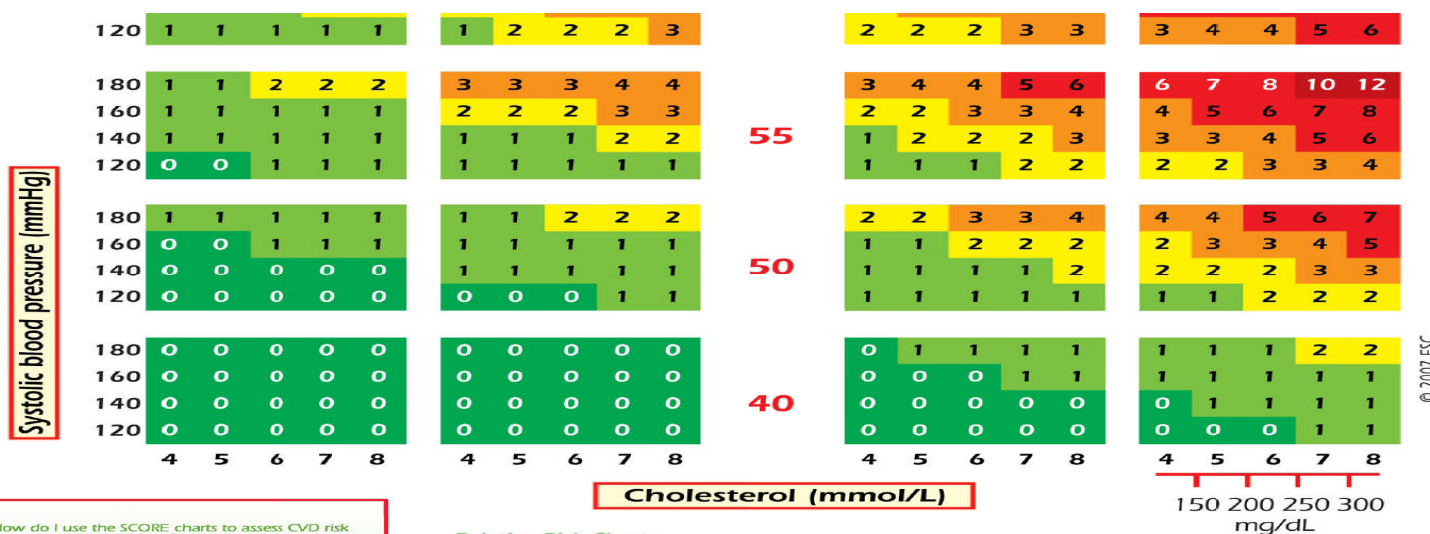
Federaal Kenniscentrum voor de Gezondheidszorg  
Centre Fédéral d'Expertise des Soins de Santé  
Belgian Health Care Knowledge Centre

# NOVEL SERUM BIOMARKERS FOR THE PREDICTION OF CARDIOVASCULAR RISK

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# Background

- Prediction of cardiovascular disease (CVD)



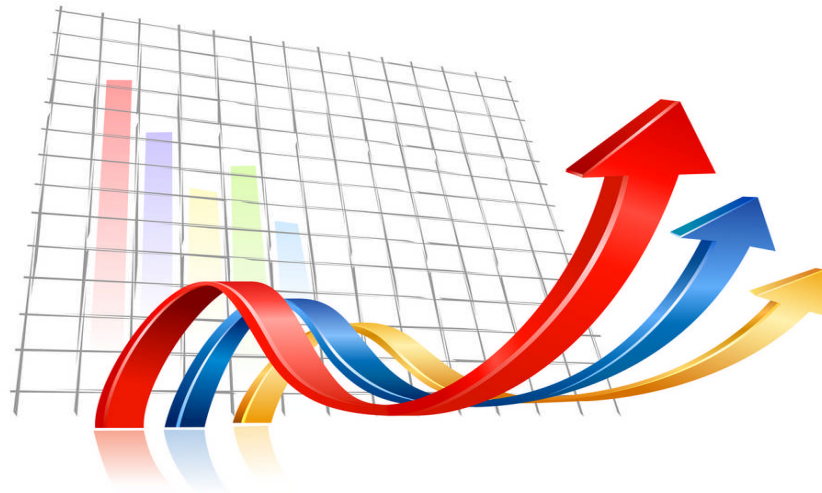
How do I use the SCORE charts to assess CVD risk

# Background

- **Risk prediction models are:**
  - **key components of primary prevention**
  - **based on conventional risk factors**
    - **age, sex, smoking, blood pressure, cholesterol**
  - **not so performant**
    - **55% of CVD deaths had been classified at “high risk” by SCORE**

# Research question

- **How to measure predictive increments?**
- **Can we improve established prediction models by measuring biomarkers?**
- **Would it be cost effective?**



# Metrics of predictive increment

- **Net Reclassification Improvement (NRI)**

$$\begin{aligned} \text{NRI} &= (P_{\text{up}|D=1} - P_{\text{down}|D=1}) - (P_{\text{up}|D=0} - P_{\text{down}|D=0}) \\ &= (\text{event NRI}) + (\text{non-event NRI}) \end{aligned}$$

- **Clinical Net Reclassification Improvement (CNRI)**

CNRI=NRI for subjects classified at intermediate CVD risk by the conventional model

# Major biomarkers - Clinical

CRP

(C-reactive protein)

- 12 studies
- NRI range: 1.52% to 11.8%
- CNRI range: 6.5% to 31.4%

NT-proBNP

(Peptide natriuretic)

# Major biomarkers - Clinical

## Lipid-based markers

- 6 studies
- NRI HDL-C range: 1.2% to 12.1%
- No added value of other markers

## Effect on risk management



# Cost-effectiveness

CRP

- Only 1 over 5 study using established model (FRS)
- Non robust results due to current gaps in clinical evidence

**No clear conclusions drawn from the analysis**



# Conclusions

- **Emerging evidence but insufficient to support measurement of biomarkers at this stage**
- **Knowledge gaps:**
  - **Sources of variations inter-studies**
  - **Predictive value of conventional factors not fully exploited**

# Recommendations

## Clinicians

- SCORE
- No added biomarkers

## Cardiology society

- Harmonize the versions of SCORE
- Integrate other conventional risk factors

## Research

- Assess benefits of measuring CRP or NT-proBNP in intermediate risk categories

# Colophon from KCE reports 201

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