NOVEL SERUM BIOMARKERS FOR THE PREDICTION OF CARDIOVASCULAR RISK

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Background

- **Prediction of cardiovascular disease (CVD)**
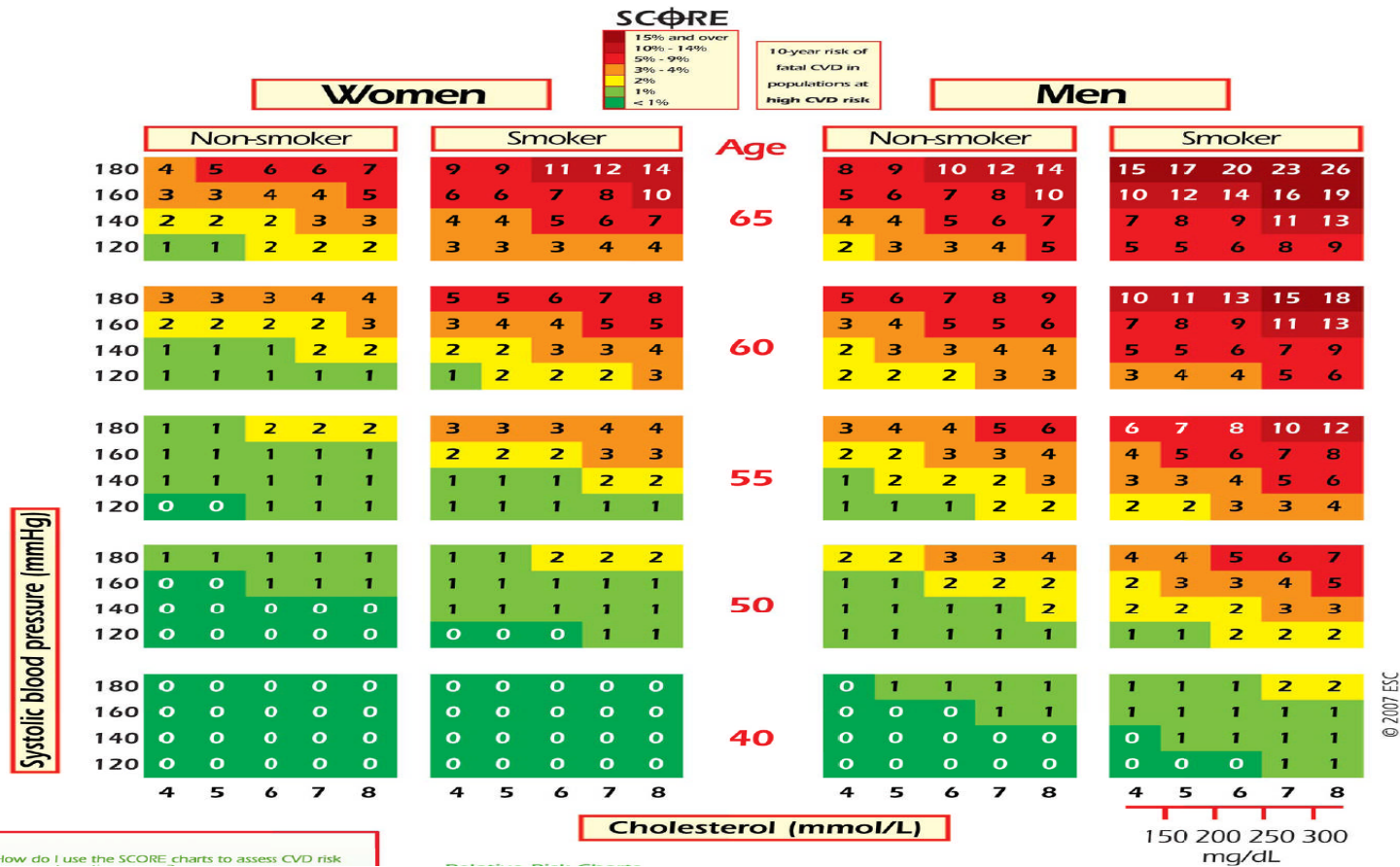
Background

- **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**

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Research question

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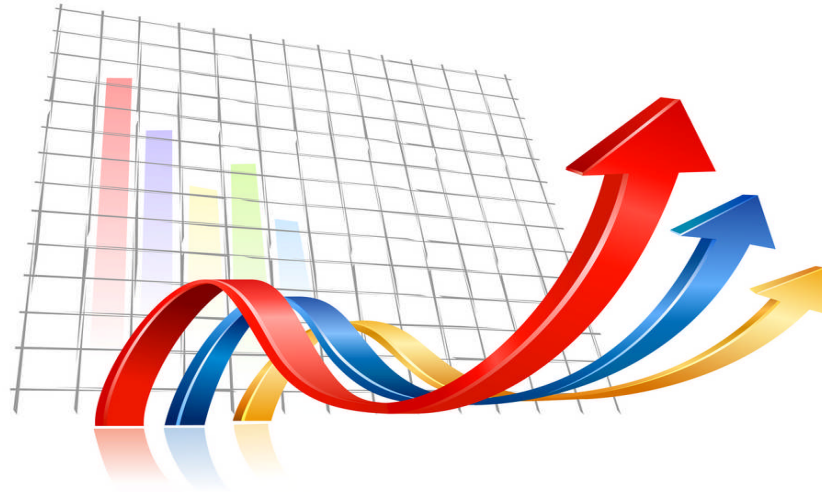
Metrics of predictive increment

- **Net Reclassification Improvement (NRI)**

$$\text{NRI} = (P_{\text{up}|D=1} - P_{\text{down}|D=1}) - (P_{\text{up}|D=0} - P_{\text{down}|D=0})$$

$$=(\text{event NRI})+(\text{non-event NRI})$$

- **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

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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**

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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

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Colophon from KCE reports 201

- **Titel : Novel serum biomarkers for the prediction of cardiovascular risk**
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- **Publication date : 19 April 2013**
- **Domain : Health Technology Assessment (HTA)**
- **MeSH: Cardiovascular Disease; Biological Markers; Decision Support Rechniques; Predictive Value of Tests**
- **NLM Classification : WG 141**
- **Language: English**
- **Format : Adobe® PDF™ (A4)**
- **Legal depot : D/2013/10.273/22**
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https://kce.fgov.be/publication/report/novel-serum-biomarkers-for-the-prediction-of-cardiovascular-risk

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