

**Friday June 10, 9:00-10:15**

**Parallel session 2**

**Diabetes & Obesity**

**Chairs: Renée de Mutsert & Frits van Osch**

- 9:00 Clinicians' perspectives on barriers and facilitators for the adoption of non-invasive liver tests: a mixed-method study (O36)  
*Yasaman Vali*
- 9:15 Development of a Neighbourhood Obesogenic Built Environment Characteristics (OBCT) index for the Netherlands (O37)  
*Thao Lam*
- 9:30 Tuberculosis risk among people with diabetes mellitus in Sub-Saharan Africa: a systematic review (O38)  
*Ilja Obels*
- 9:45 Dairy product consumption in relation to incident prediabetes and longitudinal insulin resistance in the Rotterdam Study (O39)  
*Isabel Slurink*
- 10:00 Acute and long-term mortality rates among participants of mass-participation sport events (O40)  
*Esmée Bakker*

**O36. Clinicians' perspectives on barriers and facilitators for the adoption of non-invasive liver tests: a mixed-method study.**

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**Background:** In parallel with the international rise of obesity and diabetes, the prevalence of non-alcoholic fatty liver disease (NAFLD) is also increasing. Multiple non-invasive tests (NITs) have been developed to evaluate NAFLD patients. However, their availability varies from country to country, and little is known about their implementation and adoption in clinical practice. This study aimed to explore clinicians' perspectives on barriers and facilitators that influence the adoption of NITs.

**Method:** This cross-sectional study was performed using an exploratory mixed-methods approach. Twenty-seven clinicians from eight different countries with different specialties filled in our questionnaire. Of those, 16 participated in semi-structured interviews. Qualitative and quantitative data were collected and summarized using the recently published Non-adoption, Abandonment, Scale-up, Spread, and Sustainability (NASSS) framework for new medical technologies in healthcare organizations on seven domains: 1) the condition, 2) the technology, 3) the value proposition, 4) the adopters, 5) the organization, 6) the wider system, and 7) adaptation over time.

**Results:** Several factors were reported as influencing the uptake of NITs. Among those, insufficient awareness of tests, impractical practice guidelines not yet built upon robust evidence for specific patient populations and care settings, need for extra training to perform the tests, difficult interpretation, and insufficient reimbursement were perceived as the most important barriers. Other factors were indicated as important facilitating factors: ease of use and quick measurement process, evidence showing better performance compared to other available tests, local champions (clinicians with special interest in and knowledge about the tests), proper payment system and existence of resources in academic hospitals.

**Conclusion:** Clinicians see the adoption of NITs for NAFLD as a complex process that is modulated by several factors, such as robust evidence, practical guidelines, a proper payment system, and local champions. Future research could explore perspectives from other stakeholders on the adoption of NITs.

### **O37. Development of a Neighbourhood Obesogenic Built Environment Characteristics (OBCT) index for the Netherlands.**

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Background: Studies on built environmental characteristics that drive overweight and obesity mostly focus on single exposures, whereas obesogenic environments consist of several co-occurring factors. This study aimed to compose and describe a comprehensive theory-based index to quantify obesogenicity of all administrative neighbourhoods in the Netherlands.

Methods: The OBCT index consists of 15 components related to the food (density and healthiness of food outlets) and physical activity (PA) environments (sports facilities, walkability, drivability, and bikeability). For each neighbourhood (n=12,821), components were collected for (or closest to) 2016 and processed in GIS. The index was calculated as an average of componential z-scores across the food and PA environments and ranged from 0 to 100 where higher scores indicated increased obesogenicity. We calculated descriptive statistics, Spearman correlations between the index and environmental scores and assessed whether the index was sensitive to outliers by Winsorizing components.

Results: The OBCT score for all neighbourhoods in 2016 in the Netherlands were right skewed with a median of 10.1 (IQR=2.76). The province of North Holland stood out, with Amsterdam having both the highest and the lowest scores. Obesogenicity was lower in more urban neighbourhoods, except for the highest urbanization degree (>2500 addresses/km<sup>2</sup>) where obesogenicity was highest. The overall OBCT index score was weakly correlated with the food (Spearman's  $\rho = -0.26$ , p-value<0.05) and moderately with the PA environment ( $\rho = 0.65$ , p-value<0.05). 99th percentile Winsorization of the food component significantly reduced skewness and kurtosis of the index; with median of 38.01 (IQR=10.4).

Conclusions: The novel OBCT index and its comprehensive environmental scores are potentially useful in quantifying obesogenicity of neighbourhoods. We plan to fine-tune this index before proceeding with further research.

**O38. Tuberculosis risk among people with diabetes mellitus in Sub-Saharan Africa: a systematic review.**

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Background: People with diabetes mellitus (DM) have a higher tuberculosis (TB) risk, but the evidence from sub-Saharan Africa (SSA) was scarce until recently and not included in earlier global summaries. Therefore, this systematic review aims to determine the risk of active TB disease among people with DM in SSA and whether HIV alters this association.

Methods: Medline, Embase, CINAHL, Web of Science, Global Health and African Index Medicus were searched between January 1980 and February 2021. Cohort, case-control and cross-sectional studies from SSA, which assessed the association between DM and active TB, were included if adjusted for age. Two researchers independently assessed titles, abstracts, full texts, extracted data and assessed the risk of bias. Estimates for the association between DM and TB were summarised using a random effects meta-analysis. PROSPERO: CRD42021241743.

Results: Nine eligible studies were identified, which reported on 110,905 people from 5 countries. Individual study odds ratios (OR) of the TB–DM association ranged from 0.88 (95% CI 0.17–4.58) to 10.7 (95% CI 4.5–26). The pooled OR was 2.77 (95% CI 1.90–4.05). High heterogeneity was reduced in sensitivity analysis (from  $I^2 = 57\%$  to  $I^2 = 6.9\%$ ), by excluding one study which ascertained DM by HbA1c. Risk of bias varied widely between studies, especially concerning the way in which DM status was determined.

Conclusions: There is a strong positive association between DM and active TB in SSA. More research is needed to determine whether HIV, a key risk factor for TB in SSA, modifies this relationship

**O39. Dairy Product Consumption in Relation to Incident Prediabetes and Longitudinal Insulin Resistance in the Rotterdam Study.**

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Evidence suggests neutral or moderately beneficial effects of dairy intake on type 2 diabetes mellitus risk. We examined associations between dairy intake with prediabetes risk and longitudinal insulin resistance, early phases of type 2 diabetes. We included 6770 participants (aged  $62 \pm 4$  years, 59% female) free of (pre-)diabetes at baseline from the Rotterdam Study. Baseline dairy intake was measured using food frequency questionnaires. Data on prediabetes (fasting blood glucose 6.1–6.9 mmol/L or non-fasting 7.7–11.1 mmol/L) and the homeostatic model assessment of insulin resistance (HOMA-IR) were available from 1993–2015. Associations were analyzed using Cox proportional hazard models and linear mixed models. During a mean follow-up of  $11.3 \pm 4.8$  years, 1139 incident prediabetes cases were documented (18.8%). In models adjusting for sociodemographic, lifestyle and dietary factors, a higher intake of high-fat yogurt was associated with lower prediabetes risk (HR<sub>serving/day</sub> 0.67, 0.51–0.89). In addition, a higher intake of high-fat milk was associated with lower prediabetes risk (HR<sub>serving/day</sub> 0.88, 0.79–0.99). Associations were found for low-fat dairy, low-fat milk and total cheese with a higher prediabetes risk (HR<sub>serving/day</sub> ranging from 1.05–1.07). Associations with HOMA-IR were similar to prediabetes for high-fat yogurt, low-fat dairy and low-fat milk. In conclusion, a higher intake of high-fat yogurt was associated with a lower prediabetes risk and lower longitudinal insulin resistance. Additionally, high-fat milk was associated with a lower prediabetes risk. Some low-fat dairy types were positively associated with these outcomes. Studies are needed to confirm associations and to examine the influence of confounding by population characteristics.

**O40. Acute and long-term mortality rates among participants of mass-participation sport events.**

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Background: Exercise improves health, but acute exercise transiently increases the risk for sudden death. This study examined the acute and long-term mortality risks in participants of mass-participation sport events.

Methods: Data was collected among participants of Dutch sport events between 1995 and 2017. Age, sex, and exercise type were retrieved from the event organizers, whereas the survival status and date of death were obtained from the Dutch Population Register (DPR). To examine if deceased athletes more frequently participated in sport events before their death, a time-stratified case-crossover design with an 8-day risk and reference period was used. Mixed-effects logistic regression estimated odds ratio (OR) with 95% confidence intervals (95%CI). Furthermore, a control population (i.e., individuals not partaking in sport events) was retrieved from the DPR. Cox regression models compared long-term mortality risks between recreational athletes and controls.

Results: In total, 546,876 athletes (41 years [Q25 31; Q75 50], 56% male, 72% runners) and 211,592 controls (41 years [Q25 31; Q75 50], 67% male) were included. The number of athletes participating in a sport event was higher at 0-8 days before death (i.e. risk period, N=23) compared to the reference period (i.e. 14-21 days before death, N=12), but not statistically different (OR 1.92; 95%CI 0.95-3.85). Athletes (N death=4,625, 0.8%) and controls (N death=2,494, 1.2%) were followed for a median follow-up of 3.3 years [Q25 1.1; Q75 4.8]. Participants had a 30% lower risk of death (hazard ratio 0.70; 95%CI 0.67-0.74) compared to controls after adjustment for age and sex.

Conclusion: Participants of sport events had a non-significant increased odds of death within 8-days after the event. In contrast, mortality risk was significantly lower for participants during long-term follow-up, suggesting that the health benefits of participation in a mass-participation sport event outweigh the risks.