**Comparison of the Accuracy Between AI Chatbots and Dietitians in the Evaluation of Nutrition Labels on Commercial Meal Boxes**

**Background & Aim:**
As convenience store meals become a major dietary source for urban populations, the reliability of their nutrition labels is increasingly scrutinized. With advances in artificial intelligence (AI), large language models (LLMs) have been explored for automated nutrition estimation. This study aims to evaluate the accuracy and clinical applicability of AI-predicted nutrition data by comparing outputs from five AI models and professional dietitian estimations with nutrition facts shown on the labels.

**Methods:**
Eight ready-to-eat meals from convenience store were analysed. Three clinical dietitians independently estimated the calories, macronutrients, and sodium content of meals based on measured food weights. Five AI chatbots (ChatGPT, Claude, Gemini, Grok, and Copilot) were queried multiple times with identical input prompts to assess intra- and inter-assay variability. All results were compared to the official nutrition labels to quantify discrepancies and cross-model consistency.

**Results:**
Dietitians’ estimations showed strong internal consistency (CV mostly <15%), except for dietary fibre and sodium (CVs up to 101% and 77%, respectively). Among AI models, ChatGPT showed relatively consistent calorie and carbohydrate estimates (CV <15%), but frequent over- or underestimation of protein and sodium. Sodium values were consistently underestimated across all AI models, with CVs ranging from 30% to 80%. Cross-model variability in predicted nutrient values was substantial. Literature review suggests ChatGPT-4.o outperforms peers in calorie and potassium-related estimations but remains suboptimal in micronutrient prediction.

**Discussion/Conclusion:**
Current AI chat models provide rapid estimates for basic nutrients and can aid public education or preliminary assessment. However, they lack the precision and consistency required for clinical nutrition management, particularly in persons with diabetes or CKD who demand strict control over sodium and protein intake. Professional dietitian oversight remains essential for safe and personalized meal planning.