

Synthesising Health Service Utilisation Data For A Complex Intervention – A Case Study Of Teledermatology

Laura Rouncivell,¹ Orla Jenkins,¹ Joan Quigley,¹ Derek Corrigan,¹ Connie Bulos,¹ Shibu Shrestha,¹ Roberta Gugles,¹ Emma Reece,¹ Patricia Harrington,^{1,2} Conor Teljeur,¹ Máirín Ryan^{1,2}



Background

- Health service utilisation is often an important consideration within health technology assessment (HTA) of new healthcare interventions. However, synthesising these data can be challenging:
 - Evidence may come from both randomised controlled trials (RCTs) and real-world evidence (RWE), which differ in data quality, context, and potential biases.
 - Differences in care pathways, population characteristics, and healthcare systems complicate comparisons across studies and adds to synthesis challenges.
- Teledermatology (TD) for referral management has a large evidence base; however, few RCTs are available, meaning synthesis must rely largely on RWE, which is often context-specific and heterogeneous.
- We used TD-supported referral as a case study to illustrate methods for synthesising health service utilisation (HSU) data for a complex intervention.

Methods

- We conducted a systematic review (CRD42024608084) of studies comparing TD-supported referral management with usual referral management.
 - The review yielded data for several outcome domains; the focus of this poster is related to HSU.
- Searches were run to February 2025, and screening/data extraction followed standard methods.
- Eligible designs included RCTs and comparative non-randomised studies (including single-centre experiences).
- Risk of bias was assessed using the Cochrane RoB 2 tool for RCTs and ROBINS-I for other designs.
- Tailored approach required to deal with heterogeneity in the evidence base and ensure relevance for HTA:
 - >10 intervention labels developed to capture range of TD implementation types and methods.
 - Studies grouped by dermatological population to support synthesis across diverse populations.
 - Evidence and gap map (EGM) developed to summarise distribution and gaps of evidence (Figure 1).
 - Quantitative analysis not possible – narrative synthesis supplemented by bubble plots (Figure 2 and 3).
 - GRADE framework applied to select outcomes to assess certainty of evidence to support HTA decision-making (Figure 4).

Results

- Studies included:** 120 (10 RCTs, 2 quasi-RCTs, 76 prospective non-RCTs, 32 retrospective non-RCTs).
- Sample size range:** 12 – 106,500; mostly single-centre studies. HSU data reported in 63 studies (8 RCTs) across 10 outcomes.
- Heterogeneity:** Clinical and methodological differences limited direct synthesis for HSU outcomes.
- Outcomes:** Time to definitive treatment, biopsy, and initial dermatology consultation; time to FTF appointment; prevented consultations; change in referral rates; missed appointment rates; number and duration of appointments.
- GRADE:** applied to % appointments avoided. Very low to low certainty of evidence due to risk of bias within studies.
- EGM:** highlighted imbalances in available outcome data.

Key findings

- Compared with FTF dermatology consultation, TD-supported referral management had a positive impact on HSU.
- Study settings, implementation of TD (highlighted by the EGM), and study design varied across the evidence giving rise to low certainty of evidence as assessed by GRADE.
- Reviewing TD across dermatology, rather than a single indication, increased population and disease heterogeneity, contributing to variation in HSU findings.
- While synthesising RWE for complex interventions to support HTA presents challenges, this case study shows alternative presentation formats can be used to effectively summarise the evidence when meta-analysis is not feasible.

Figure 1. Evidence and gap map

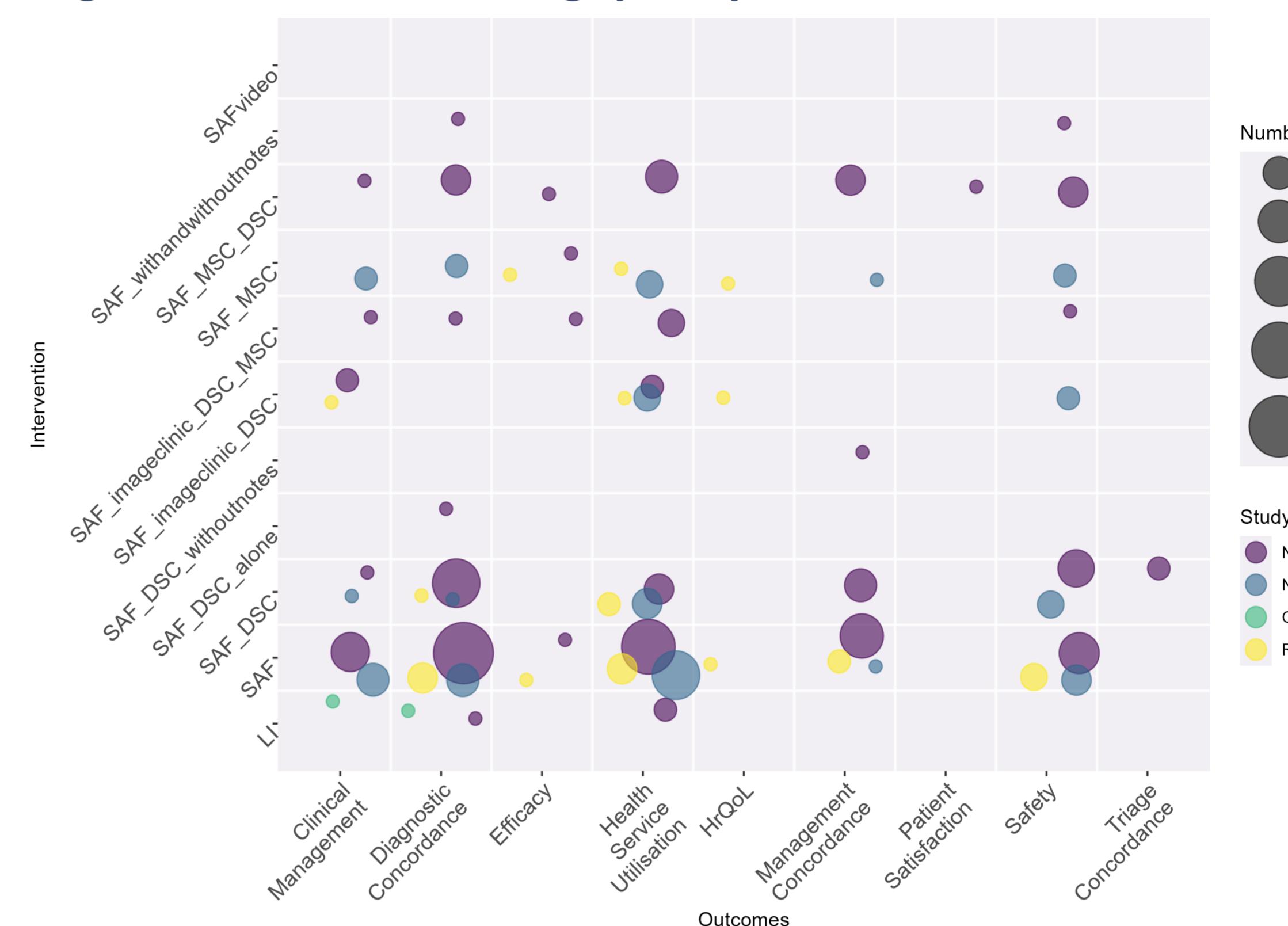


Figure 2. Face-to-face appointments avoided with teledermatology

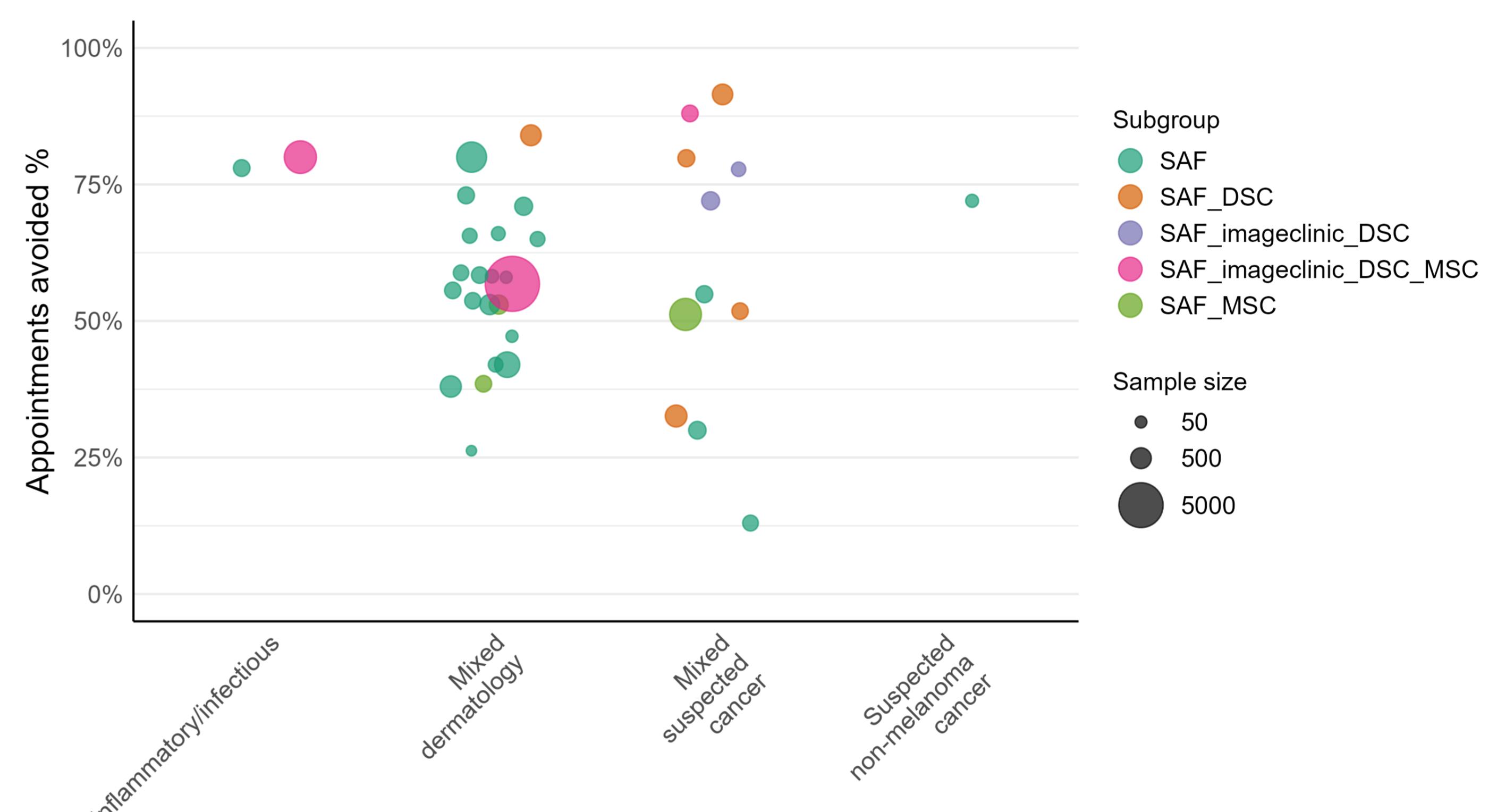


Figure 3. Wait time to definitive treatment in days

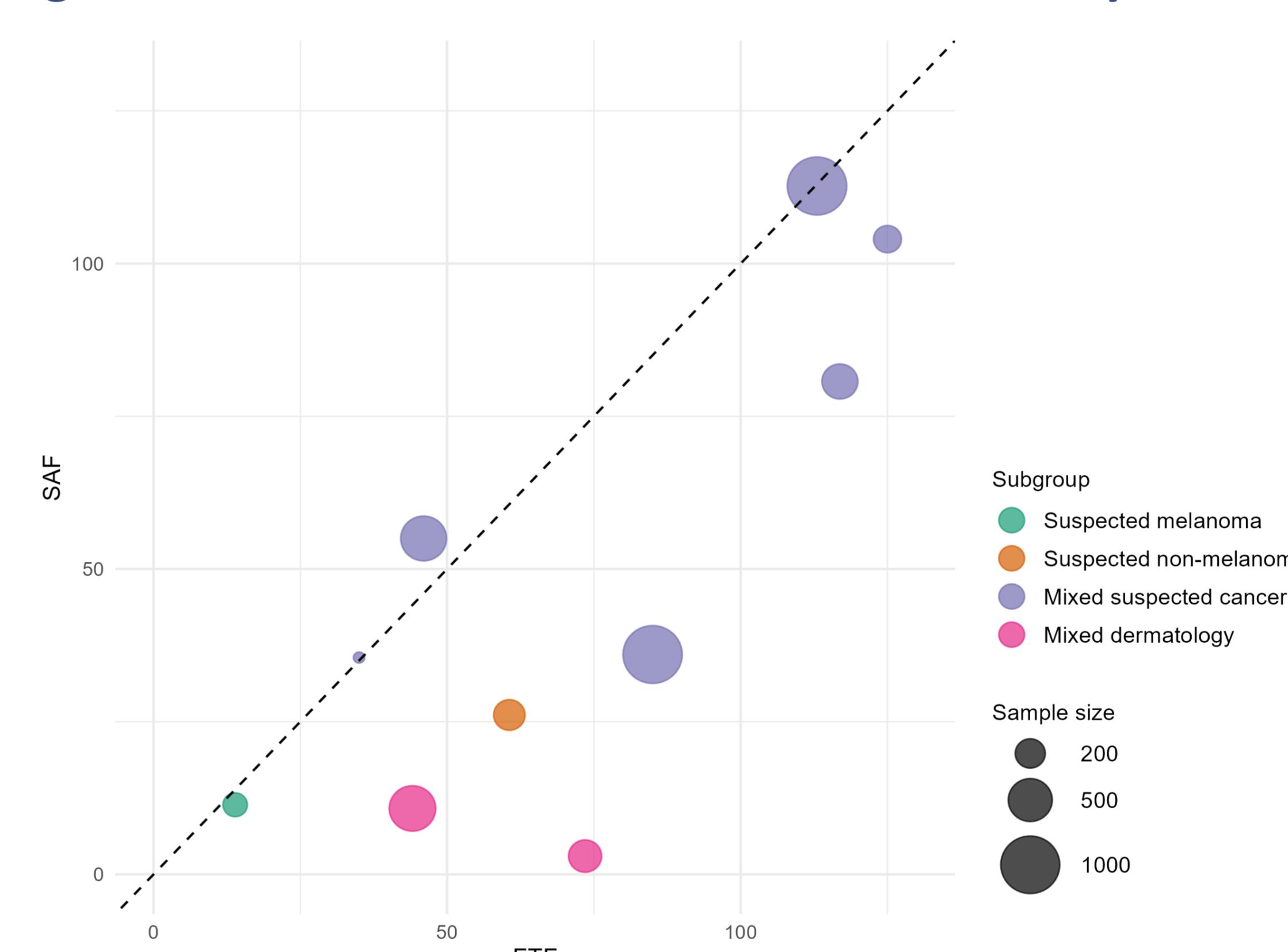
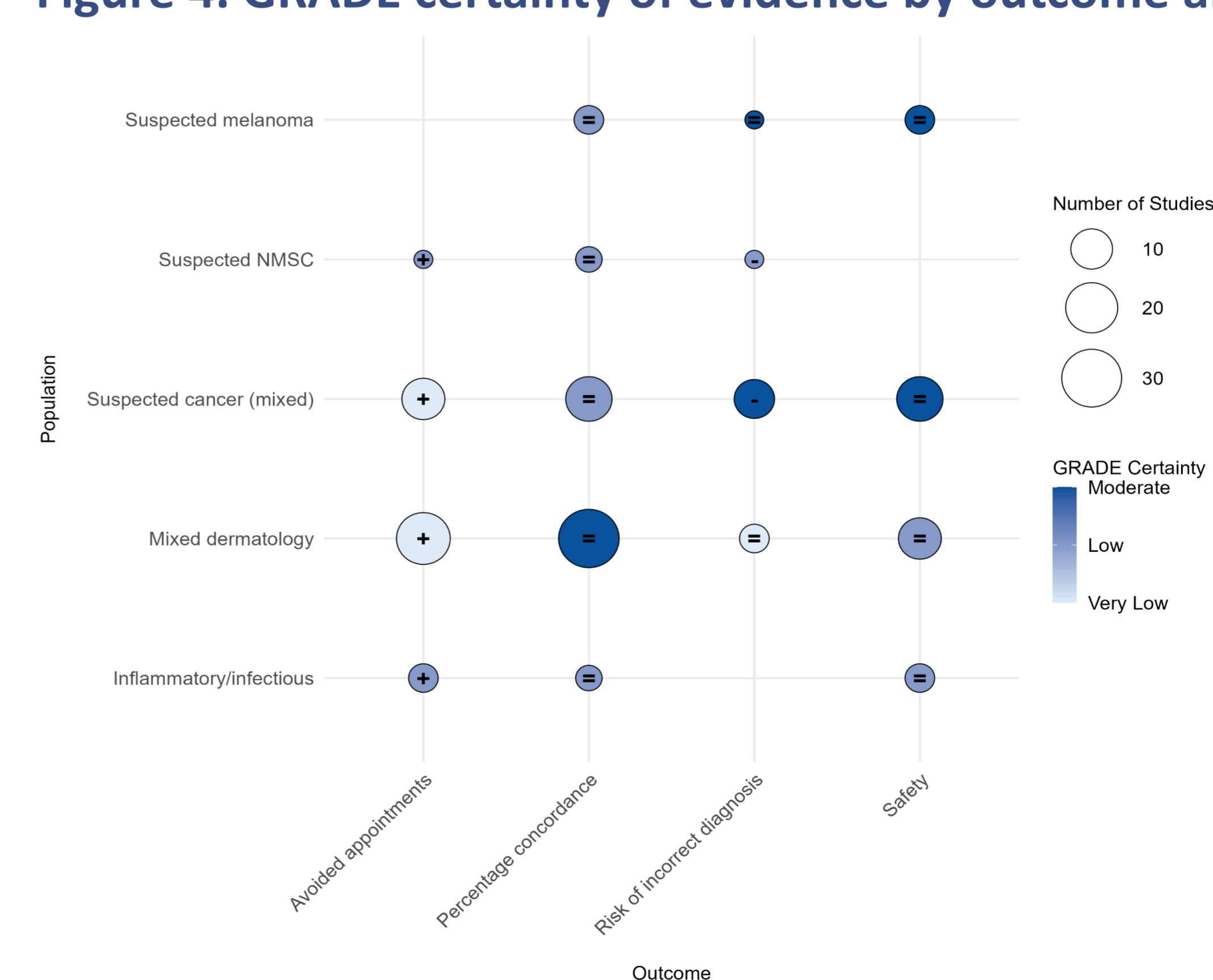


Figure 4. GRADE certainty of evidence by outcome and population



Author Affiliations:

¹ Health Information and Quality Authority, Dublin, Ireland

² Trinity College Dublin, Dublin, Ireland

Contact: L. Rouncivell, Health Information and Quality Authority, Dublin, Ireland. Email: lrouncivell@hiqa.ie.