OBJECTIVE
To assess the cost-effectiveness of secukinumab 300mg (SEC300) versus current treatment options for plaque psoriasis in adults from a Canadian public payer perspective.

METHODOLOGY
Type of Evaluation
• Cost-utility analysis.
Study Perspective
• Canadian public health care system.
Target Population
• Similar to the pivotal phase III clinical trials ERASURE and FIXTURE; adults aged ≥18 with moderate to severe plaque-type psoriasis, and who are candidates for systemic therapy defined as having chronic plaque-type psoriasis considered inadequately controlled by at least one of the following therapies: topical treatment, phototherapy, previous systemic therapy including biologic therapy.
Comparators
• Biologicals (secukinumab 300mg (SEC300), secukinumab 150mg (SEC150), ustekinumab 45mg (UST45), ustekinumab 90mg (UST90), etanercept (ETN), adalimumab (ADA), infliximab (INF)).
• Standard of care (SoC): methotrexate, ciclosporine, topical corticosteroids, phototherapy.
Model
• Microsoft Excel-based Markov model with 4-week cycles for the first 52 weeks, followed by annual cycles.
• Health states and decision to switch therapy to SoC for first year defined by PASI response, as illustrated.
• Year >2: health states responders (PASI ≤75) continued with the active treatment until they switch to SoC due to the failure of the active treatment or death. Non-responders received SoC until death.

Time Horizon
• 10 years, which allows for the extrapolation of response benefit beyond trials.

Modeling Efficacy
A mixed-treatment comparison estimated the relative treatment effect and efficacy of SEC compared to ADA, ETN, INF and UST in patients with moderate to severe plaque psoriasis.
• Treatment effect was entered in the model as the proportion of patients achieving a particular response at 4, 8, and 12 weeks.
• At 8 weeks, a drop-out rate to SoC of 9.7% was used for all biologic treatments, based on SEC300 data from the ERASURE trial.
• Beyond 52 weeks, a constant annual drop-out rate to SoC of 20% was used for all treatments, representing a long-term adherence pattern to biologic therapies and a more passive SoC-75 health state.

Discounting
• Discount rate of 5% was applied for both costs and health benefits.

Survival Data
• All-cause mortality was included in the model, using annual rates based on life tables for Canada. There was no additional risk of mortality applied due to moderate to severe plaque psoriasis.

Quality of Life
• Utility gains from baseline for PASI <50, PASI 50-74, PASI 75-89, and PASI 90-100 were derived from a Canadian cost-utility analysis on biologics for the treatment of psoriasis.

Resource Use and Costs
• Treatment frequency and dosing was based on each biologic’s product monograph, and expert opinion for SoC. Laboratory tests for monitoring and routine physician visits were based on published literature and expert opinion.
• The direct cost associated with administration of biologics is funded by each manufacturer through patient support programs. Therefore, only the acquisition cost of each biologic was included in our analysis.
• All costs are reported in 2014 Canadian Dollars. Where costs are available from more than one province, Ontario costs were used as a proxy for all of Canada.
• Unit costs for treatments and healthcare visits were gathered from standard Canadian sources.

RESULTS

Clinical Outcomes
• Patients on INF gained the most QALYs over the 10 year horizon, followed by SEC300. SoC gained the least QALYs.

Cost Outcomes
• Direct non-drug costs for the patients on biologics were similar, ranging from $2,740 to $2,970, and were slightly higher for SEC ($3,556). Patients treated with INF incurred the highest costs due to higher total medication costs.

Cost-Effectiveness
• Only SoC, SEC300 and INF pathways appear on the cost-effectiveness frontier. ETN was strongly dominated, while ADA, UST45, SEC150 and UST90 were weakly dominated. The ICER for SEC300 versus SoC was $87,368 per QALY gained. INF treatment was more costly, but resulted in more QALYs compared to SEC300, resulting in an ICER of $1,039,403 per QALY gained.

Deterministic Sensitivity Analyses
• Results comparing SEC300 to SoC indicated that model results are most sensitive to the time horizon, the cost of the biologics, and the utility source. Although not shown on the diagram, at 1 year, UST90 was not dominated, and the ICER for SEC300 versus UST90 was $325,615/QALY gained.

Probabilistic Sensitivity Analysis
• PSA of 1,000 iterations for SEC300 versus SoC resulted in SEC300 being more costly but more effective than SoC in all simulations. The average ICER was $58,117 per QALY gained.
• SoC had a 100% probability of being the most cost-effective comparator up to a willingness to pay (WTP) threshold of $70,000. At a WTP threshold of approximately $90,000 and above, SEC300 had the highest probability of being the most cost-effective option.

CONCLUSION
For adults with moderate to severe plaque psoriasis, SEC300 was associated with increased QALYs at a lower incremental cost compared to ETN, ADA, and UST. For each QALY gained versus SoC, treatment with secukinumab 300mg was estimated to cost an additional $87,368, the most cost-effective option when compared to biologic agents currently funded by public drug plans in Canada.