life. Anemia is a common complication of CKD that may occur with, and increases with, disease progression. Mathematical models based on robust epidemiological and clinical data are a useful way to predict the future burden of disease; this is important for the planning of health services. This study reports a microsimulation model, *Inside ANEMIA of CKD*, that projects the epidemiological burden of anemia of CKD up to 2025 in Canada.

**Methods:** A virtual cohort representing the Canadian population was created, using national demographic statistics, within the *Inside ANEMIA of CKD* microsimulation model framework. Virtual individuals were ascribed an age-sex stratified CKD status (defined by estimated glomerular filtration rate and albuminuria levels, in accordance with international guidelines) and anemia status (defined by hemoglobin level as mild, moderate or severe, in accordance with WHO criteria). Key co-morbidities were also assigned, reflecting country-specific population statistics. Canadian demographics and epidemiological data were drawn from Statistics Canada and a provincial renal database. Incidence rates for cardiovascular complications were drawn from the literature.

**Results:** Preliminary results indicate that the overall prevalence of CKD in Canada is projected to increase by an absolute rate of 1% from 2020 to 2025, irrespective of population growth. The number of individuals with anemia of CKD is estimated to increase from 1.8 to 2.7 million cases by 2025. A 16% increase is projected for patients with moderate to severe anemia of CKD by 2025. The incidence of cardiovascular complications in patients with all levels of anemia of CKD is expected to increase by 2025 as follows: 28% increase in heart failure and a 20% increase in myocardial infarction events.

**Conclusions:** Inside ANEMIA of CKD is the first microsimulation model to project the epidemiological burden of anemia attributable to CKD in Canada. As more individuals are affected by anemia of CKD over the next five years, co-morbidities such as cardiovascular disease will increase in parallel. Implementing healthcare policies that are aimed at identifying and proactively managing patients with anemia of CKD may reduce this substantial healthcare burden.

**Conflict of Interest:** This research was funded by AstraZeneca and conducted by HealthLumen. GSJJ, CC, GS, RN, BP, PA, WD are employed by AstraZeneca Limited and hold stock options. RL, WL are employed by HealthLumen. TN and WJ received consulting fees to provide advice on this work. In addition, TN reports personal fees from Roche Inc, other from ClinPredict Inc., grants and personal fees from Astra Zeneca Inc, personal fees from Otsuka Inc, grants and personal fees from Janssen, personal fees from Boehringer Ingelheim/Eli Lilly, grants, personal fees and other from Tricida Inc, other from PulseData, other from Mesentech, outside the submitted work. WJ is a consultant or member of advisory boards for: AstraZeneca, Akebia, Vifor, Rockwell Medical, he is a member of the Speakers Bureau for: AstraZeneca, Akebia.

**POS-321**

TRANSFORMING THE FINDINGS OF THE ROXADUSTAT NDD GLOBAL PHASE 3 PROGRAM INTO COST OFFSETS FROM A CANADIAN HEALTHCARE PERSPECTIVE

Schneider, J1, Davies, S2, Howarth, A2, GARCIA SANCHEZ, J1,*1, Rao, N1, Grandy, S1, Bhatt, P1, Parackal, A1, Wong, D1, Briggs, A1

1Avalon Health Economics, CEO of Avalon Health Economics, Morristown, United States; 2Avalon Health Economics, Health Economics, Morristown, United States; 3AstraZeneca, Health Economics, Cambridge, United Kingdom; 4AstraZeneca, Global Pricing and Market Access, Cambridge, United Kingdom; 5AstraZeneca, Global Pricing and Market Access, Gaithersburg, United States; 6AstraZeneca, Biopharmaceuticals Medical, Wilmington, United States, 7AstraZeneca, Innovation- Value & Access Strategy, Mississauga, Canada

**Introduction:** Chronic kidney disease (CKD) is a costly public health issue, with an estimated prevalence of 13.4% globally. Anemia is a common complication associated with CKD resulting in reduced health-related quality of life and high healthcare costs. The objective of this analysis was to estimate the direct medical care cost offsets of investigational agent roxadustat for the treatment of anemia in patients with non-dialysis dependent (NDD) CKD from a Canadian healthcare perspective.

**Methods:** Data from the ROXADUSTAT global Phase 3 program were used to estimate the projected incidence of rescue therapy use (intravenous iron, erythropoiesis stimulating agents or red blood cell transfusions) and major adverse cardiovascular events plus (MACE+) for roxadustat compared to standard of care (placebo) in NDD patients with anemia of CKD. MACE+ events included myocardial infarction, stroke, hospitalized unstable angina, hospitalized congestive heart failure, cardiovascular death, and other death. Published Canadian cost data were used to estimate the cost of each medical event. A hypothetical cohort of 10,000 NDD Canadian patients with anemia of CKD aged 18 years and older was modeled with net medical care cost offsets calculated in Canadian dollars for each of the five years and cumulatively. Patients who transitioned to dialysis during the time horizon of the analysis were also evaluated in this cost offsets analysis.

**Results:** Compared to standard of care, preliminary results of the model for patients with NDD CKD and patients who transitioned to dialysis during the five year horizon of the analysis showed that roxadustat could produce net medical care cost offsets resulting from the reductions in rescue therapy usage and reduction in MACE+ events (specifically hospitalizations due to HF). Cumulative medical care cost offsets for patients with NDD CKD and patients who transitioned to dialysis during the five year horizon of the analysis compared with standard of care were estimated for rescue therapy use ($1,428,501) and MACE+ ($1,496,865).

**Conclusions:** This cost offsets analysis provides evidence that treatment with roxadustat, in NDD patients with anemia of CKD and patients who transition to dialysis, could result in lower total medical care net costs compared to the costs of standard of care.

**Conflict of Interest:** This research was funded by AstraZeneca and conducted by Avalon Health Economics. GSJJ, RN, GS, BP, PA, WD are employed by AstraZeneca Limited and hold stock options. SJ, DS, HA and BA are employed by Avalon Health Economics.

**POS-322**

INSIDE CKD: PROJECTING THE FUTURE BURDEN OF CHRONIC KIDNEY DISEASE IN THE AMERICAS AND THE ASIA-PACIFIC REGION USING MICROSIMULATION MODELLING

GARCIA SANCHEZ, J1,*1, Tangri, N2, Abdul Sultan, A3, Batista, MC1, Cabrera, C6, Chadban, S6, Chertow, G7, Kanda, E8, Li, G9, Nolan, S10, Retat, L11, Xin, S12, Webber, L11, Wish, J13, Xu, M11

1AstraZeneca, Health Economics, Cambridge, United Kingdom; 2University of Manitoba, Chronic Disease Innovation Center, Winnipeg, Canada; 3AstraZeneca, Epidemiology, Cambridge, United Kingdom; 4Hospital Israeilitz Albert Einstein, Neurology, Sao Paulo, Brazil; 5AstraZeneca, Epidemiology & Evidence Excellence, Gothenburg, Sweden; 6Royal Prince Alfred Hospital, Renal Medicine, Sydney, Australia; 7Stanford University School of Medicine, Division of Nephrology, Palo Alto, United States; 8Kawasaki Medical University, Medical Science, Okayama, Japan; 9Sichuan Academy of Medical Science, Nephrology, Chengdu, China; 10AstraZeneca, Diabetes, Cambridge, United Kingdom; 11HealthLumen, Microsimulation modelling, London, United Kingdom; 12West China Hospital- Sichuan University, Epidemiology- Evidence Based Medicine- Disease Management and Healthcare Policy, Chengdu, China, 13Indiana University School of Medicine, Nephrology, Indianapolis, United States

**Introduction:** Chronic kidney disease (CKD) is a debilitating and costly condition, affecting about 10% of people globally. In the past decade, the increasing prevalence of CKD has been linked to rising rates of cardiovascular disease events, adverse renal outcomes and mortality. The future trajectories of CKD prevalence, progression and outcomes, as
well as related costs, are critical considerations for public health and policy planning. Inside CKD aims to project, for the 2020–2025 period, the public health burden of CKD in Canada using a patient-level microsimulation-based model.

Methods: A patient-level microsimulation was developed to estimate the epidemiological burden of CKD in six countries across the Americas and the Asia-Pacific region; the initial analysis focused on Canada. A virtual population was constructed using relevant results from the published literature. Selected data inputs included country demographics and the prevalence rates of CKD, comorbidities and incidence rates of complications. In the simulation, CKD stages were defined as discrete health states in line with Kidney Disease: Improving Global Outcomes (KDIGO) 2012 recommendations. Canadian demographics and epidemiological data were drawn from Statistics Canada and a provincial renal database. Model validation and calibration were conducted following established methods for health economic modelling. Additional analyses on data from the US, Brazil, China, Japan and Australia are ongoing to extend findings to the wider region.

Results: Irrespective of population growth, the size of the CKD population in Canada is projected to increase by 7% to 6.2M, and the prevalence of CKD is estimated to grow by 1% (from 15% to 16%), by 2025. Projected changes to the profile of the population with CKD between 2020 and 2025 suggest a prevalence increase in stages 2–5. CKD prevalence is projected to increase annually over the next 5 years in the 35–64-year-old age category which will impact the ‘working’ population; however, the greatest projected increase in absolute cases during this period is predicted to occur among people ≥65 years old.

Conclusions: Based on projections for the epidemiological burden of CKD over a 5-year period, the Inside CKD validated microsimulation model demonstrates that CKD poses a serious public health concern in Canada. Collating and modelling reliable epidemiological data will facilitate policy interventions and expedite the development of a sustainable healthcare infrastructure for CKD.

Figure. Canadian projected annual disease burden of CKD by age, 2020–2025.

Conflict of Interest: This research was funded by AstraZeneca and conducted by HealthLumen. JGGS, AAS, CC, SN are employed by AstraZeneca Limited. LW, LR, MX are employed by HealthLumen. NT, MCB, SC, GC, EK, GL, SX, JW received consulting fees to provide advice on this research. JW is a consultant to or a member of advisory boards for: AstraZeneca, Akebia, Vifor, Rockwell Medical, he is on the speakers bureau for: AstraZeneca, Akebia. NT reports personal fees from the Go Inc, other from ClinPredict Inc., grants and personal fees from Astra Zeneca Inc, personal fees from Otsuka Inc, grants and personal fees from Janssen , personal fees from Boehringer Ingelhein/Eli Lilly, grants, personal fees and other from Tricida Inc, other from PulseData, other from Mesentech, outside the submitted work. SC has received fees for advisory board participation and/or presentations from Astra Zeneca, Novartis and Astellas.

POS-323
INSIDE CKD: PROJECTING THE FUTURE BURDEN OF CHRONIC KIDNEY DISEASE IN EUROPE USING MICROSIMULATION MODELLING

GARCIA SANCHEZ, JJ1, Power, A2, Abdul Sultan, A3, Årnlov, J4, Cabrera, C5, De Nicola, L6, Halimi, JM7, Mennini, FS8, Navarro-González, JF9, Nolan, S10, Retat, L11, Webber, L11, Xu, M11

1AstraZeneca, Health Economics, Cambridge, United Kingdom; 2North Bristol NHS Trust, Renal Medicine, Bristol, United Kingdom; 3AstraZeneca, Epidemiology, Cambridge, United Kingdom; 4Karolinska Institutet - Division of Family Medicine and Primary Care, Department of Neuroradiology, Care Sciences and Society, Stockholm, Sweden; 5AstraZeneca, Epidemiology & Evidence Excellence, Gothenburg, Sweden; 6University Luigi Vanvitelli, Department of Advanced Medical and Surgical Sciences, Naples, Italy; 7University Hospital of Tours, Nephrology & Transplantation ward, Tours, France; 8University of Rome “Tor Vergata”, EEHTA CEIS- Faculty of Economics, Rome, Italy; 9University Hospital Nuestra Señora de Candelaria, Research Unit & Nephrology Service, Santa Cruz de Tenerife, Spain; 10AstraZeneca, Diabetes, Cambridge, United Kingdom; 11HealthLumen, Microsimulation modelling, London, United Kingdom

Introduction: Chronic kidney disease (CKD) is a debilitating and costly condition, affecting about 10% of people globally. Progression of CKD is associated with increased incidence of cardiovascular events, adverse renal outcomes and mortality, as well as high costs from renal replacement therapy (RRT) in end-stage renal disease. The future trajectories of CKD prevalence, progression and outcomes and their related costs, are critical considerations for public health and policy planning. Inside CKD aims to project, for the 2020–2025 period, the public health burden of CKD in Europe using a patient-level microsimulation-based model.

Methods: An initial analysis for the UK was then adapted to other European countries. A virtual population was constructed using the following data from publicly available sources: country demographics and prevalence rates of CKD, RRTs and comorbidities, along with incidence rates of related complications. In the microsimulation, CKD stages were defined according to Kidney Disease: Improving Global Outcomes (KDIGO) 2012 recommendations. Patients were categorized according to estimated glomerular filtration rate (eGFR) and albuminuria status using data from the Health Survey for England (HSE) extrapolated to the UK population. Model validation and calibration were conducted following established methods for health economic modelling. RRT projections were calibrated against historical trends from the UK Renal Registry.

Results: Preliminary results for the UK demonstrate that, irrespective of population growth, the prevalence of CKD is projected to increase by 1% (from 13% to 14%) by 2025. The size of the CKD population is projected to grow from 9.07M in 2020 to 9.63M by 2025. Changes to the profile of the CKD population are also projected, with an increase in the more advanced stages (3b–5) of ~7% relative to the total CKD population by 2025. Increases in CKD prevalence are projected for all age categories (18–34, 35–64 and 65+ years); however, the 35–64-year-old age category is projected to have the largest relative impact, with a 20% rise in overall cases. RRT is projected to increase by 10.9% in the general UK population.

Conclusions: Inside CKD is a validated microsimulation model that predicts increases in CKD prevalence and associated adverse cardio renal complications over a 5-year period. The predicted increases pose a public health concern in the UK and potentially across Europe. The largest increase in CKD is predicted to be within the 35–64-year-old ‘working’ population. This could have wider societal implications due to possible productivity losses. Policy interventions aimed at early identification of patients and slowing of disease progression could lower this projected burden. Estimates from the whole of Europe will provide information at country level.

Figure. Projected growth in annual disease burden of CKD by stage in the UK.

Conflict of Interest: This research was funded by AstraZeneca and conducted by HealthLumen. JGGS, AAS, CC, SN are employed by...