An Early Assessment of the Real-World Treatment Patterns of Type 2 Diabetes: A Comparison to the 2018 ADA/EASD Consensus Report Recommendations

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| Diagnoses                        | Codes Used                                      |
|---------------------------------|------------------------------------------------|
| Atherosclerosis                 | ICD9: 440.xx; ICD10 I70                        |
| Other IHD                       | ICD9: 411.xx; ICD10 I24                        |
| Angina pectoris                 | ICD9: 413.xx; ICD10 I20                        |
| Other chronic IHD               | ICD9: 414.xx; ICD10 I25.1, I25.5, I25.6, I25.7, I25.8, I25.9 |
| Myocardial infarction (acute)   | ICD9: 410.xx; ICD10 I21., I22., I23            |
| Ventricular fibrillation        | ICD9: 427.1x, 427.3x; ICD10 I49.0               |
| Atrial fibrillation             | ICD9: 427.4x, 427.5x; ICD10 I48                 |
| Other ASCVD                     | ICD9: 429.2x                                    |
| Old myocardial infarction       | ICD9: 412.xx; ICD10 I25.2                      |
| Heart failure                   | ICD9: 428.xx; ICD10 I50                        |
| Atherosclerosis, severe         | ICD9: 440.23, 440.24                           |
| Aortic aneurysm/dissection      | ICD9: 441.xx; ICD10 I71                        |

Abbreviations: ASCVD, atherosclerotic cardiovascular disease; IHD, ischemic heart disease.
### Supplementary Table 2 – Explanatory variables selected for the multivariate logistic regression model

| Variables Included in the Model | Variables Not Selected by the Model |
|---------------------------------|--------------------------------------|
| **Clinical group: Obesity**      | Meglitinides (history)               |
|                                 | Number of diabetes drug classes (current) |
| **Clinical group: Indicator of CKD** | Sulfonylureas (history)               |
|                                 | Number of diabetes drugs (current)    |
| **Clinical group: High risk or history of ASCVD** | Thiazolidinediones (history)         |
|                                 | Myocardial infarction                |
| **Clinical group: History of HF** | Insulin (history)                    |
|                                 | Congestive heart failure             |
| **Clinical group: Need to minimize hypoglycemia** | Number of diabetes drug classes (current) |
|                                 | Peripheral vascular disease          |
| **Age**                         | Number of diabetes drugs (current)   |
|                                 | Cerebrovascular disease              |
| **CCI score**                   |                                      |
|                                 |                                      |
| **Years from onset of type 2 diabetes** |                                      |
|                                 |                                      |
| **Gender**                      | Peripheral vascular disease          |
|                                 | Renal disease                        |
| **Primary onset of diabetes**   | Cerebrovascular disease              |
| **Region**                      | Diabetes without chronic complications |
| **Dementia**                    | Diabetes with chronic complications  |
| **Chronic pulmonary disease**   | Renal disease                        |
| **Rheumatic disease**           | Heart failure (history and current)  |
| **Peptic ulcer disease**        | ASCVD (history)                      |
| **Mild liver disease**          | ASCVD (current)                      |
| **Hemiplegia or paraplegia**    | Heart failure (current)              |
| **Any malignancy, including lymphoma and leukemia** | ASCVD (history)                     |
|                                 | SGLT2 inhibitors (history)           |
| **Moderate or severe liver disease** | ASCVD (current)                    |
| **Metastatic solid tumor**      | GLP-1 RA (history)                  |
| **AIDS or HIV**                 | Oral GLP-1 RA (current)              |
| **Liver disease**               | SGLT2 inhibitors (current)           |
| **Stroke (history)**            | GLP-1 RA (current)                  |
| **Hypertension (history and current)** | Oral GLP-1 RA (current)             |
| **Atrial fibrillation or flutter (history and current)** | Category of number of diabetes drug classes (current) |
| **Anemia (history and current)** | GLP-1 RA (current)                  |
| **NASH related liver disease (history and current)** | Category of number of diabetes drug classes (current) |
| **Amylin analogues (history)**  | Category of number of diabetes drugs (current) |
| **Amylin Analogues (current)**  | Severe Hypoglycemia (history)        |
| **Alpha-Glucosidase Inhibitors (history)** | Dyslipidemia (history and current)   |
| **Biguanide (history)**         | Hyperlipidemia                       |
| **DPP-4 Inhibitors (history)**  | Lipids                              |
|                                 | Weight loss medications FDA approved |

Abbreviations: AIDS, acquired immunodeficiency syndrome; ASCVD, atherosclerotic cardiovascular disease; CCI, Charlson Comorbidity Index; CKD, chronic kidney disease; DPP-4, dipeptidyl peptidase-4; FDA, Food and Drug Administration; GLP-1 RA, glucagon-like peptide-1 receptor agonist; HF, heart failure; HIV, human immunodeficiency virus; NASH, non-alcoholic steatohepatitis; SGLT-2i, sodium-glucose co-transporter-2 inhibitor.
Supplementary Table 3 – Use of GLP-1 RA and/or SGLT-2i in 2019 modelled by multivariate logistic regression: Commercial cohort results for the 5 clinical groups and for the most important (Wald Chi-square) 20 significant variables sorted by their decreasing importance

| Variable               | Unit       | Odds Ratio | Wald Lower Confidence Limit for Odds Ratio | Wald Upper Confidence Limit for Odds Ratio | Wald Chi-square |
|------------------------|------------|------------|--------------------------------------------|--------------------------------------------|-----------------|
| OBESITY                |            | 1.251      | 1.231                                      | 1.272                                      | 709.4622        |
| HF                     |            | 0.817      | 0.783                                      | 0.853                                      | 107.1069        |
| ASCVD                  |            | 0.968      | 0.945                                      | 0.992                                      | 107.1069        |
| CKD                    |            | 0.744      | 0.721                                      | 0.769                                      | 323.0626        |
| HYPO                   |            | 0.679      | 0.615                                      | 0.748                                      | 60.3179         |
| WT LOS MED             |            | 5.229      | 5.099                                      | 5.362                                      | 16548.3519      |
| DPP4 PAST              |            | 1.895      | 1.852                                      | 1.939                                      | 2950.1353       |
| AGE                    | 10.0000    | 0.828      | 0.818                                      | 0.837                                      | 1104.4119       |
| REGION NORTH EAST      |            | 1.094      | 1.066                                      | 1.123                                      | 819.4631        |
| REGION SOUTH           |            | 1.248      | 1.223                                      | 1.274                                      | 819.4631        |
| REGION WEST            |            | 0.910      | 0.884                                      | 0.938                                      | 819.4631        |
| SU PAST                |            | 1.393      | 1.361                                      | 1.426                                      | 768.7819        |
| METFORMIN CURRENT      |            | 0.727      | 0.709                                      | 0.745                                      | 628.3028        |
| METFORMIN PAST         |            | 1.331      | 1.298                                      | 1.366                                      | 478.5694        |
| CCI SCORE              | 1.0000     | 1.086      | 1.078                                      | 1.095                                      | 435.2974        |
| STATIN                 |            | 1.267      | 1.239                                      | 1.296                                      | 433.1141        |
| ICOSAPENT ETHYL        |            | 1.938      | 1.811                                      | 2.073                                      | 366.9845        |
| HI DEDUC HP vs PPO     |            | 0.991      | 0.972                                      | 1.010                                      | 325.2977        |
| HMO vs PPO             |            | 0.802      | 0.783                                      | 0.822                                      | 325.2977        |
| ANEMIA                 |            | 0.842      | 0.826                                      | 0.859                                      | 282.7470        |
| TUMOR                  |            | 0.480      | 0.437                                      | 0.527                                      | 236.6111        |
| INSULIN PAST           |            | 1.236      | 1.197                                      | 1.275                                      | 173.2770        |
| MALIGNANCY             |            | 0.797      | 0.769                                      | 0.825                                      | 160.9854        |
| HYDRAZINE              |            | 0.675      | 0.635                                      | 0.718                                      | 157.8943        |
| FIBRATES               |            | 1.151      | 1.125                                      | 1.178                                      | 142.1196        |
| INSULIN CURRENT        |            | 1.189      | 1.152                                      | 1.226                                      | 118.3040        |
| DIURETICS              |            | 0.896      | 0.878                                      | 0.914                                      | 115.0806        |
| HYPERTENSION           |            | 1.141      | 1.113                                      | 1.170                                      | 105.9369        |

Included sample in the regression for the Commercial cohort (N=322,788). Abbreviations: ASCVD, atherosclerotic cardiovascular disease; CCI, Charlson Comorbidity Index; CKD, chronic kidney disease; DPP-4, dipeptidyl peptidase-4; HF, heart failure; HI DEDUC HP, High Deductible Health Plan; HMO, Health Maintenance Organization; HYPO, hypoglycemia; PPO, Preferred Provider Organization; SU, Sulfonylureas; WT LOS MED, weight loss medication.
Supplementary Table 4 – Use of GLP-1 RA and/or SGLT-2i in 2019 modelled by multivariate logistic regression: Medicare cohort results for the 5 clinical groups and for the most important (Wald Chi-square) 20 significant variables sorted by their decreasing importance

| Variable             | Unit | Odds Ratio | Wald Lower Confidence Limit for Odds Ratio | Wald Upper Confidence Limit for Odds Ratio | Wald Chi-square |
|----------------------|------|------------|--------------------------------------------|-------------------------------------------|-----------------|
| OBESITY              |      | 1.260      | 1.206                                      | 1.317                                      | 105.6937        |
| HF                   |      | 0.815      | 0.759                                      | 0.874                                      | 32.3281         |
| ASCVD                |      | 1.015      | 0.962                                      | 1.072                                      | 32.3281         |
| CKD                  |      | 0.796      | 0.745                                      | 0.851                                      | 45.4018         |
| HYPO                 |      | 0.653      | 0.545                                      | 0.783                                      | 21.2123         |
| WT LOS MED           |      | 11.447     | 10.701                                     | 12.245                                     | 5030.6946       |
| AGE                  | 10.0000 | 0.479   | 0.461                                      | 0.497                                      | 1423.2464       |
| DPP4 PAST            |      | 1.973      | 1.860                                      | 2.092                                      | 511.7589        |
| REGION NORTH EAST    |      | 1.469      | 1.367                                      | 1.579                                      | 120.0192        |
| REGION SOUTH         |      | 1.232      | 1.148                                      | 1.321                                      | 120.0192        |
| REGION WEST          |      | 1.361      | 1.233                                      | 1.503                                      | 120.0192        |
| SU PAST              |      | 1.373      | 1.291                                      | 1.461                                      | 100.9033        |
| MALE                 |      | 1.249      | 1.196                                      | 1.305                                      | 99.6948         |
| TZD PAST             |      | 1.317      | 1.225                                      | 1.415                                      | 56.3268         |
| ANEMIA               |      | 0.841      | 0.803                                      | 0.881                                      | 53.9432         |
| HI DEDUC HP vs PPO   |      | 0.979      | 0.819                                      | 1.171                                      | 47.4733         |
| HMO vs PPO           |      | 0.796      | 0.746                                      | 0.850                                      | 47.4733         |
| ICOSAPENT ETHYL      |      | 1.764      | 1.493                                      | 2.085                                      | 44.3069         |
| INSULIN CURRENT      |      | 1.354      | 1.237                                      | 1.483                                      | 43.0071         |
| HYDRAZINE            |      | 0.701      | 0.628                                      | 0.783                                      | 39.5863         |
| DEMENTIA             |      | 0.682      | 0.602                                      | 0.774                                      | 35.6236         |
| METFORMIN PAST       |      | 1.228      | 1.143                                      | 1.318                                      | 31.8864         |
| T2D ONSET YEARS      | 1.0000 | 0.974   | 0.965                                      | 0.983                                      | 30.5746         |
| STATIN               |      | 1.228      | 1.139                                      | 1.323                                      | 28.7489         |
| METFORMIN CURRENT    |      | 0.855      | 0.805                                      | 0.909                                      | 25.2409         |
| MALIGNANCY           |      | 0.851      | 0.798                                      | 0.908                                      | 23.7839         |
| HEMI/PARAPLEGIA      |      | 0.668      | 0.567                                      | 0.786                                      | 23.4851         |
| CCI SCORE            | 1.0000 | 1.042   | 1.023                                      | 1.060                                      | 20.4760         |

Included sample in the regression for the Medicare cohort (N=70,456). Abbreviations: ASCVD, atherosclerotic cardiovascular disease; CCI, Charlson Comorbidity Index; CKD, chronic kidney disease; DPP-4, dipeptidyl peptidase-4; HF, heart failure; HI DEDUC HP, High Deductible Health Plan; HMO, Health Maintenance Organization; HYPO, hypoglycemia; PPO, Preferred Provider Organization; SU, Sulfonylureas; TZP, thiazolidinediones WT LOS MED, weight loss medication.