

Supplementary table 1. ATC codes used to define the treatment groups.

Drug Group	ATC	Description
Insulin	A10A*	Insulin alone
Metformin	A10BA02 OR A10BD02 OR A10BD05	Metformin alone or in pre-established association with sulphonylureas or with pioglitazone
Sulphonylureas/Glinides	A10BB* OR A10BX02	Sulphonylureas or glinides
Acarbose/Pioglitazone	A10BF01 OR A10BG03 OR A10BD06	Pioglitazone alone or in pre-established association with sulphonylureas
DPP4i	A10BH* OR A10BD07/08/09/10/11/21	DPP4i alone or in pre-established association with metformin
GLP-1 RA	A10BJ*	GLP-1 RA alone
SGLT2i	A10BK* OR A10BD13/15/16/19/20/23	SGLT2i alone or in pre-established association with metformin

Abbreviations: DPP4i, Dipeptidyl-Peptidase-4 inhibitors; GLP-1 RA, Glucagon-like peptide-1 receptor agonists; SGLT2i, Sodium-glucose cotransporter 2 inhibitors. * denotes further extension of the ATC class.

Supplementary table 2. ICD-9-CM codes used to define hospitalization.

ICD-9-CM codes	Description
043*	SARS-CoV-2 disease (COVID-19)
480.4*	Pneumonia in COVID-19
518.9*	Respiratory Distress Syndrome (ARDS) in Covid-19
519.7*	Other respiratory tract infection in Covid-19
V01.85	Exposure to SARS-CoV-2
V07.00	Need for isolation due to risk associated with SARS-CoV-2 infection
V12.04	Personal history of SARS-CoV-2 (Covid-19) disease
V71.84	Observation and Evaluation for Suspected SARS-CoV-2 Exposure
078.89	SARS-CoV-2 disease
518.8	Other diseases of lung
428*	Heart failure
410*	Acute myocardial infarction
411*	Altre forme acute e subacute di cardiopatia ischemica
414*	Other acute and subacute forms of ischemic heart disease
413*	Angina pectoris
434*	Occlusion of cerebral arteries
444*	Arterial embolism and thrombosis

Note: The ICD-9-CM coding related to SARS-CoV-2 infection was updated with the Italian Ministry of Health Decree on 28 October 2020. * denotes further extension of the ICD-9 code.

Supplementary table 3. Criteria used to define comorbidities taken in consideration.

Pathology	Co-payment exemption codes	Drug prescriptions (ATC codes)	Algorithm
Hypertension	031	C07* OR C08* OR C09*	≥ 2 drug prescriptions in 1 year OR exemption code
Dyslipidemia	025	C10*	≥ 2 drug prescriptions in 1 year OR exemption code
Cardiovascular diseases ^a	A02 OR B02 OR C02 OR 021	B01AA* OR B01AC* (NOT B01AC06) OR B01AE* OR B01AF*	≥ 2 drug prescriptions in 1 year OR exemption codes
Renal failure	023	B03XA*	≥ 4 drug prescriptions in 1 year OR exemption code
Primary immunodeficiency	RCG160	J06BA*	≥ 1 drug prescriptions in 1 year OR exemption code
Acquired immunodeficiencies	-	L01* OR L3AA* OR L04* OR H02AB*	≥ 2 drug prescriptions in 1 year
Cancer	048	-	Exemption code 048
Chronic respiratory diseases	024 OR 057	R03A*	≥ 4 drug prescriptions in 1 year OR exemption codes

Note: ^a heart failure, arrhythmias, atrial fibrillation, ischemic heart disease. * denotes further extension of the ATC class.