

Supplementary Materials for

Effectiveness of different local actions to control vitamin D prescription in Italy

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This PDF file includes:

- **Mathematical formulas of statistical models;**
- **Table S1.** Pharmacological class of vitamin D and analogous: outpatient NHS expenditure and packages for active substances 2013, 2018, 2019 comparison;
- **Figure S1.** Trend of cholecalciferol consumption (DDD per 1,000 inhabitants/day) over the years 2013-2019 in Italy;
- **Table S2.** Cholecalciferol outpatient NHS expenditure: packages and average cost, expenditure, use (IU);
- **Table S3.** Total annual expenditure and consumption of cholecalciferol in Sardinia - years 2013-2019 (absolute value and percent change);
- **Figure S2.** National cost of cholecalciferol stratified by different formulations. Years 2013-2019;
- **Figure S3.** National and regional variability of cholecalciferol use (DDD per 1,000 inhabitants/day) over the years 2016-2019 (values and percentage changes);
- **Figure S4.** National and regional trend of cholecalciferol use (DDD per 1,000 inhabitants/day) (a) and expenditure (b). Years 2016-2019.

Mathematical formulas of statistical models.

In model A only the explicating variable t was considered and evaluated data before regional interventions:

$$y_t = b_0 + b_1time + v_t \quad (2).$$

In model B the variable was evaluated over the whole period.

In model C, compared to model B, also the provisions' effect in changing of the average level of the dependent variable was evaluated:

$$y_t = b_0 + b_1time + b_2dummy + v_t \quad (3).$$

In model D, compared to model B, also the effect of the resolution in the trend changing was tested:

$$y_t = b_0 + b_1time + b_3time_post + v_t \quad (4).$$

In model E, compared to model D, the seasonality component was also controlled:

$$y_t = b_0 + b_1time + b_3time_post + b_4seasonality + v_t \quad (5).$$

In model F, compared to model D, the provisions' effect in changing of the average level of the dependent variable was also considered:

$$y_t = b_0 + b_1time + b_2dummy + b_3time_post + v_t \quad (6).$$

Finally, model G is the complete one:

$$y_t = b_0 + b_1time + b_2dummy + b_3time_post + b_4seasonality + v_t \quad (7).$$

Table S1
Pharmacological class of vitamin D and analogous: outpatients NHS expenditure and packages for active substances - 2013, 2018, 2019 comparison

ATC	2013			2018			2019			Δ 2019 - 2018		
	Expenditure €	%	Packages N. of packages	Expenditure €	%	Packages N. of packages	Expenditure €	%	Packages N. of packages	Expenditure €	%	Packages N. of packages
A11CC01	59,233	0.0%	13,970	0.1%								
A11CC02	528,575		57,831									
A11CC03	5,527,834	4.3%	530,152	2.6%			9,077,818	2.7%	765,641	1,061,386	13.2%	63,286
A11CC04	12,067,990	9.4%	1,863,079	9.1%			12,747,809	3.8%	1,920,346	-104,423	-0.8%	-17,257
A11CC05	73,064,750	57.1%	12,988,646	63.2%			281,280,392	83.3%	34,931,581	84,20,668	3.1%	-323,478
A11CC06	4,100,668	3.2%	745,576	3.6%			10,278,779	3.0%	1,703,488	2,427,758	30.9%	320,773
of which	4,100,668	3.2%	745,576	3.6%			6,702,448	2.0%	1,218,621	-168,494	-2.5%	-30,636
DIDROGYL - 1MG/10ML Oral Drops												
NEODIDRO - 0.266 MG SOFT CAPSULES - 5 CAPSULES BLISTER							1,141,599	0.3%	234,896	823,103	258.4%	169,362
NEODIDRO - 0.266 MG SOFT CAPSULES - 10 CAPSULES BLISTER							2,434,732	0.7%	249,971	1,773,149	268.0%	182,047
A11CC TOTAL	95,349,051	74.6%	16,199,254	78.8%			313,384,799	92.9%	39,321,056	11,805,388	3.9%	43,324
A12AX TOTAL	32,530,149	25.4%	4,365,666	21.2%			24,123,640	7.1%	3,109,003	-2,211,125	-8.4%	-300,422
TOTAL	127,879,200	100.0%	20,564,920	100.0%			337,508,438	100.0%	42,430,059	9,594,264	2.9%	-257,098

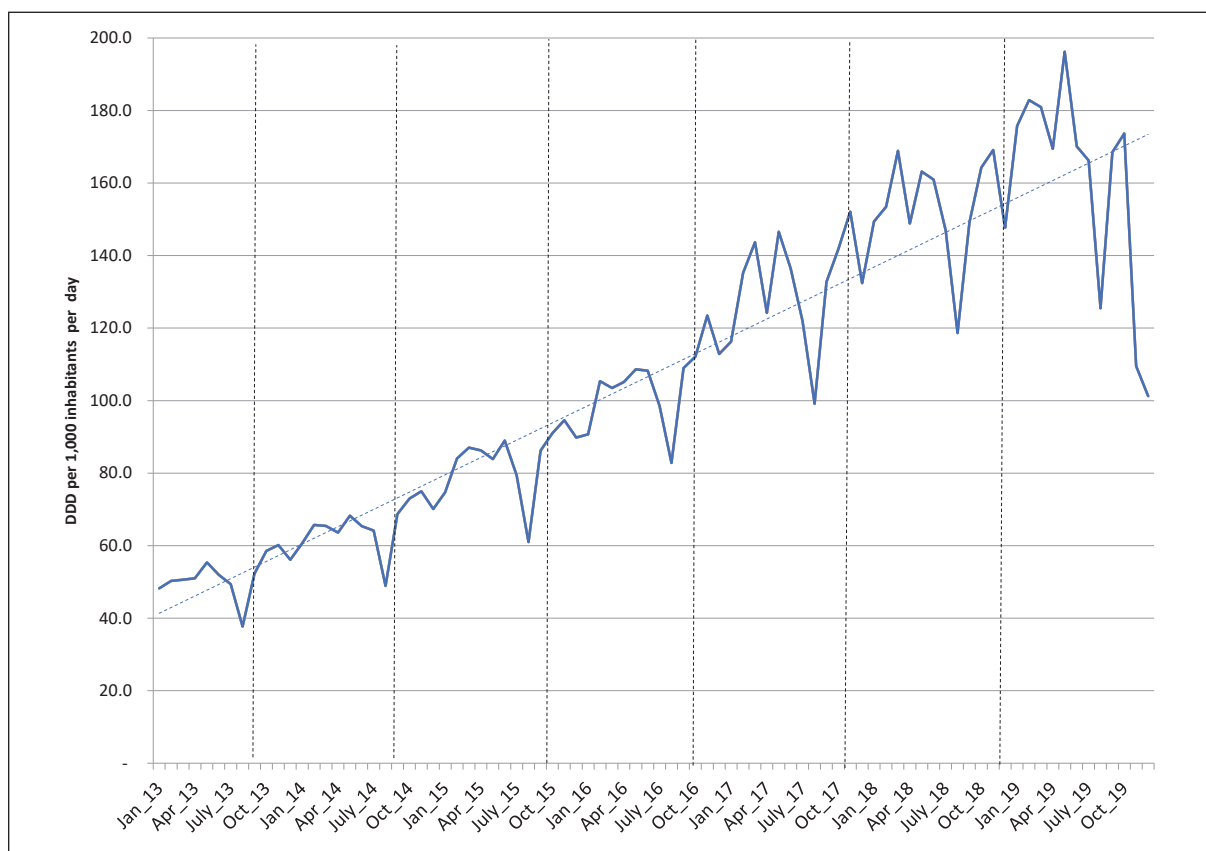


Figure S1
Trend of cholecalciferol consumption (DDD per 1,000 inhabitants/day) over the years 2013-2019 in Italy.

Table S2
Cholecalciferol outpatient NHS expenditure: packages and average cost, expenditure, use (IU)

PHARMACEUTICAL FORM	Packs - absolute value		Packs - % value		Expenditure - absolute value (Euros)		Expenditure - % value		Average cost per 1,000 IU		Average cost per pack	
	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019
1 BOTTLE OF 10 ML WITH DOSYNG SYRINGE or ORAL DROPS BOTTLE	5,961,274.0	6,033,209.0	16.9	17.3	31,853,229.9	32,279,320.3	11.7	11.5	0.053	0.054	5.3	5.4
6 VIALS INJECTABLE SOLUTION 100,000 IU	188,882	293,792	0.5	0.8	755,529.70	1,175,171.34	0.3	0.4	0.007	0.007	4.0	4.0
2 VIALS INJECTABLE SOLUTION 300,000 IU	5,477.0	2,600.0	0.0	0.0	19,169.5	9,100.0	0.0	0.0	0.006	0.006	3.5	3.5
6 VIALS INJECTABLE SOLUTION FOR ORAL USE/INTRAMUSCULAR 100,000 IU	752,975	641,124	2.1	1.8	3,011,910.18	2,564,505.54	1.1	0.9	0.007	0.007	4.0	4.0
2 VIALS INJECTABLE SOLUTION FOR ORAL USE/INTRAMUSCULAR 300,000 IU	106,218.0	79,343.0	0.3	0.2	371,764.6	277,701.9	0.1	0.1	0.006	0.006	3.5	3.5
1 BOTTLE/ORAL SOLUTION CONTAINER 25,000 IU	7,973,960	5,156,902	22.6	14.8	41,118,339.18	26,427,742.18	15.1	9.4	0.206	0.205	5.2	5.1
2 BOTTLE/ORAL SOLUTION CONTAINER 25,000 IU	13,374,636.0	15,234,346.0	37.9	43.6	104,951,638.0	118,722,242.0	38.5	42.2	0.157	0.156	7.8	7.8
1 BOTTLE/ORAL SOLUTION CONTAINER 50,000 IU	1,549,319	1,215,260	4.4	3.5	12,694,107.19	9,811,293.86	4.7	3.5	0.164	0.161	8.2	8.1
2 BOTTLE/ORAL SOLUTION CONTAINER 50,000 IU	5,342,318.0	6,275,005.0	15.2	18.0	78,084,035.7	90,013,314.7	28.6	32.0	0.146	0.143	14.6	14.3
TOTAL	35,255,059	34,931,581	100.0	100.0	272,859,724	281,280,392	100.0	100.0	0.101	0.101	7.7	8.1

Table S3

Total annual expenditure and consumption of cholecalciferol in Sardinia years 2013-2019 (absolute value and percent change)

	Expenditure data						
	2013	2014	2015	2016	2017	2018	2019
Total expenditure	4,002,768	5,576,900	7,438,309	6,885,764	5,793,548	5,407,780	5,274,484
Change (t/t-1)		39.3%	33.4%	-7.4%	-15.9%	-6.7%	-2.5%
	Consumption data						
	2013	2014	2015	2016	2017	2018	2019
DDD per 1000 inhab./day	54.8	74.9	100.2	146.9	169.8	176.2	175.0
Change (t/t-1)		36.6%	33.8%	46.5%	15.6%	3.8%	-0.7%

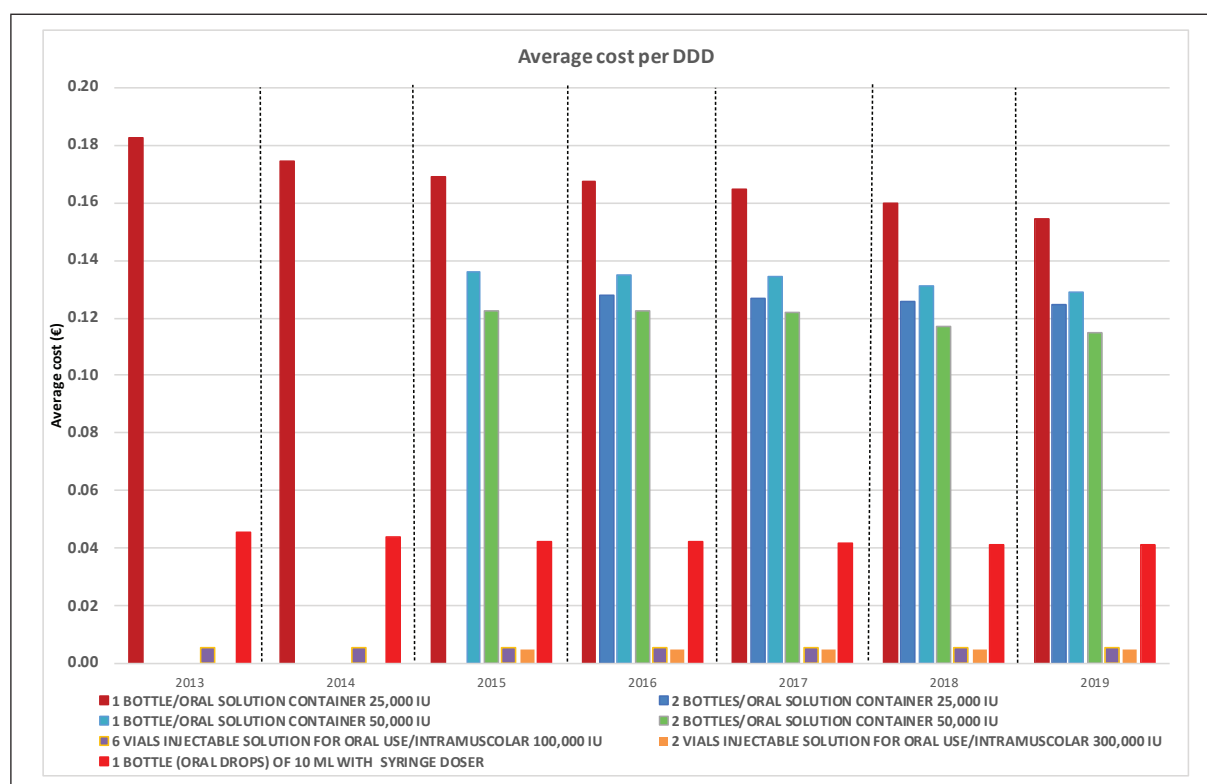


Figure S2

National cost of cholecalciferol stratified by different formulations. Years 2013-2019.

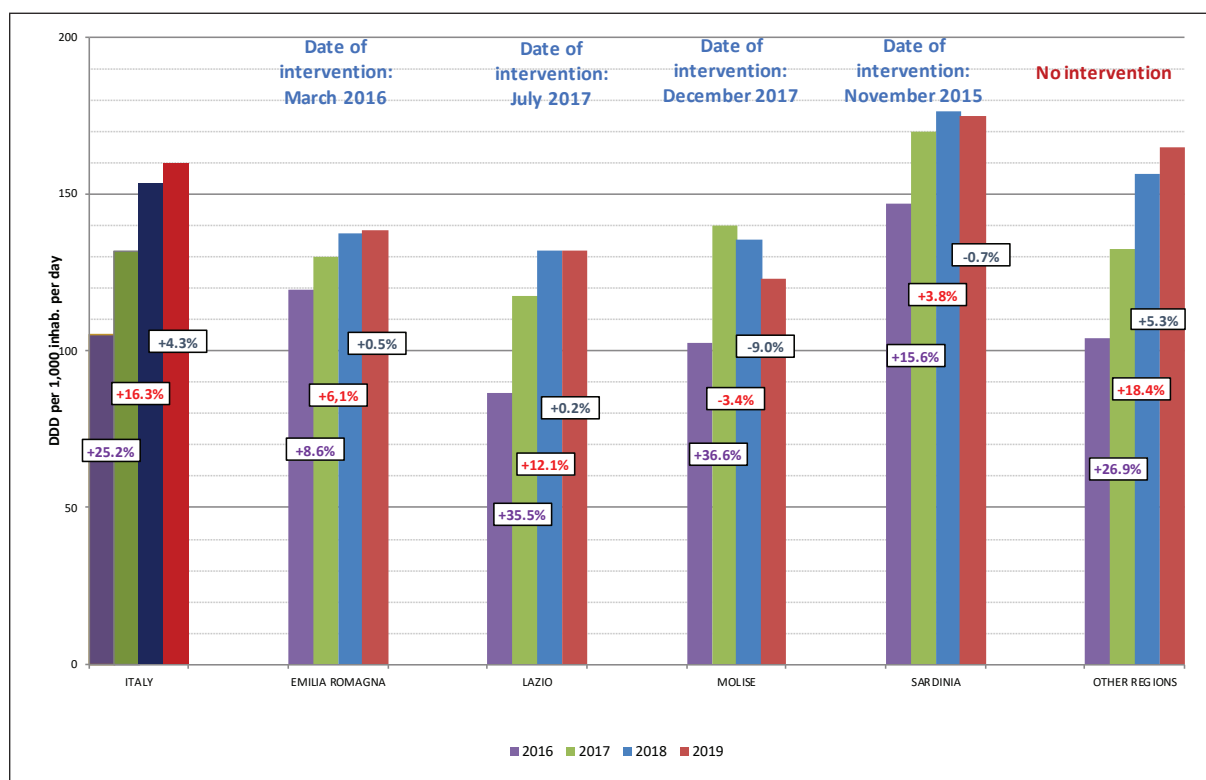


Figure S3 National and regional variability of cholecalciferol use (DDD per 1,000 inhabitants/day) over the years 2016-2019 (values and percentage changes).

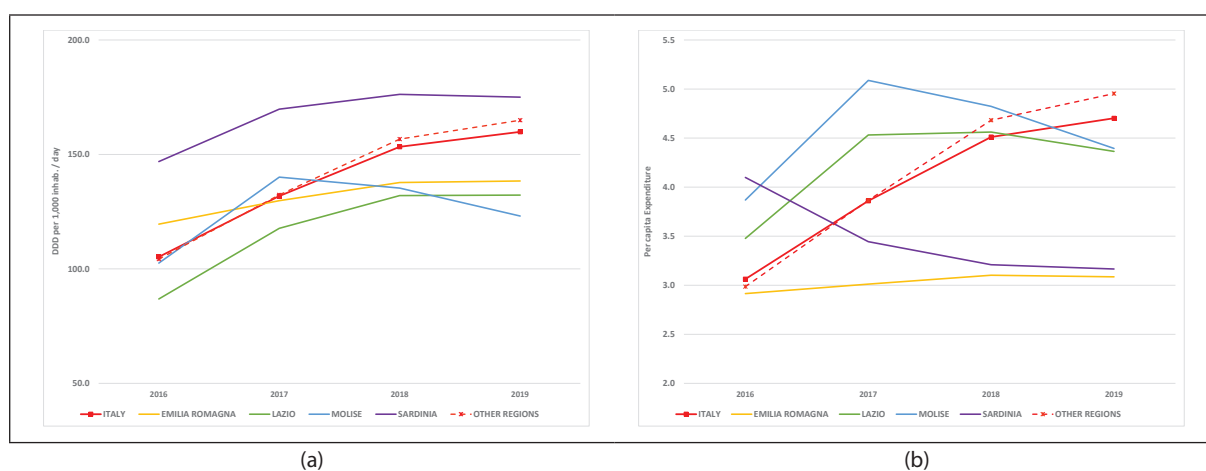


Figure S4 National and regional trend of cholecalciferol use (DDD per 1,000 inhabitants/day) (a) and expenditure (b). Years 2016-2019.