

WP9: Expanding economic analysis for HTA: methods for measuring fiscal impact of new healthcare interventions

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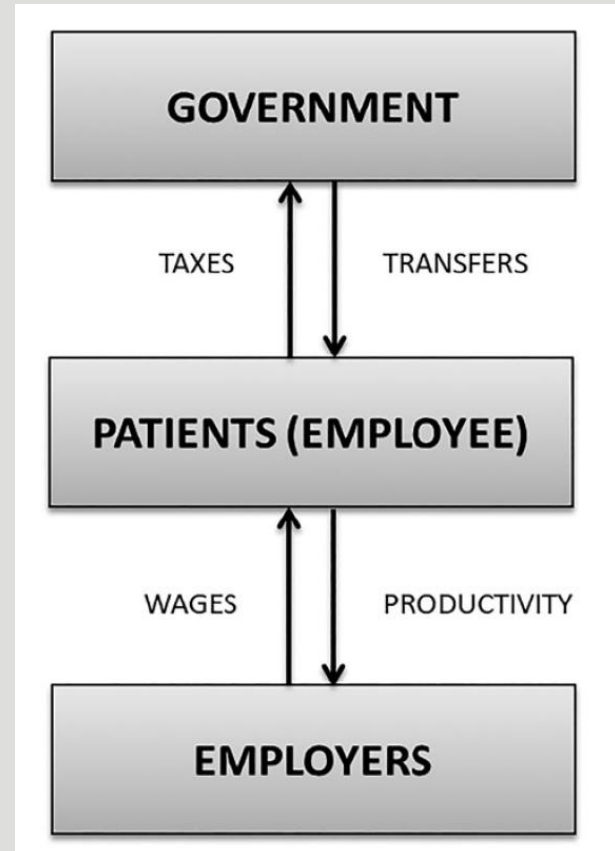
Rome, 8th June 2021



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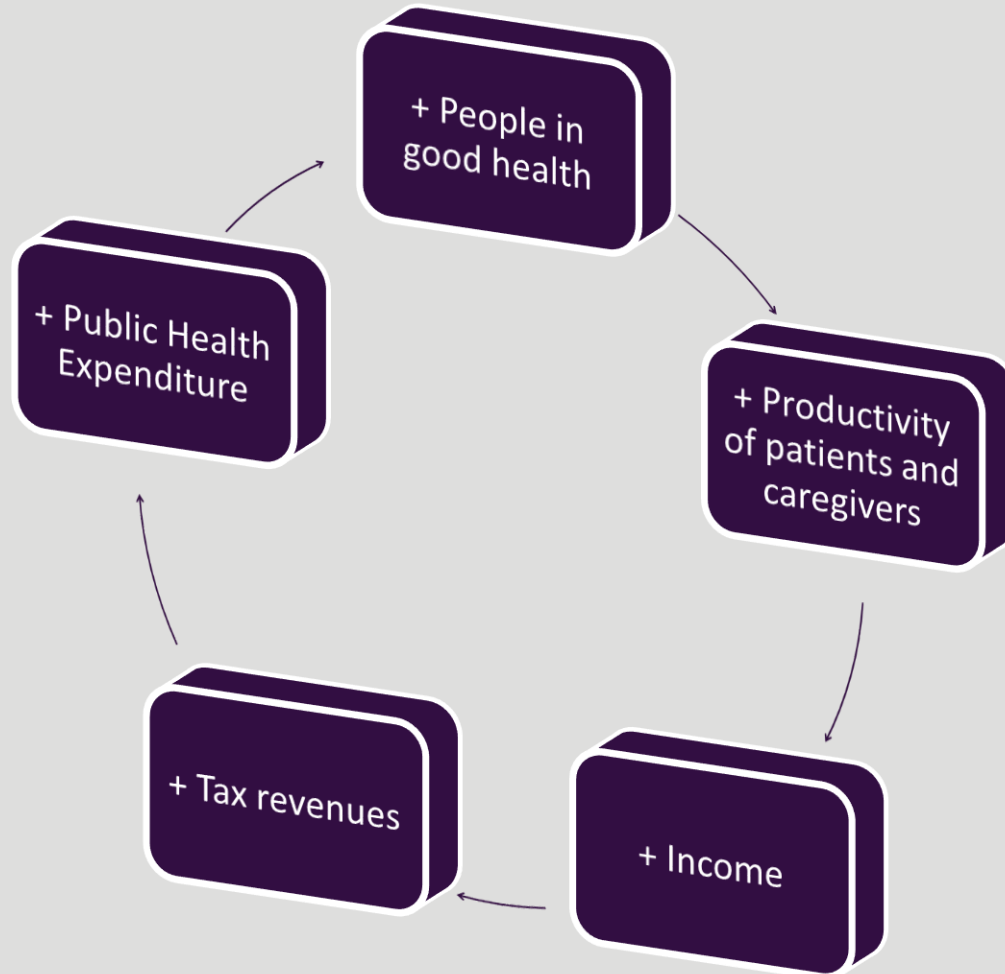
Theoretical framework

- The accumulation of human capital and the increase of population's health are the key-drivers for economic growth and the result of an endogenous process.
- Therefore, governments should invest in new medical technologies to increase population's health thus enhancing productivity growth.
- Increases in productivity would increase income and therefore consumption and tax revenues that would be used to increase investment in health.



Assumption: only full time-permanent workers (not free lance) are considered

The framework



Algorithm for the estimation of the fiscal impact of new technologies 1-2

IMPACT HTA

Algorithm for the
estimation of the
fiscal impact of new
technologies



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Algorithm for the estimation of the fiscal impact of new technologies 2-2

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- Deterministic analysis

Deliverable D9.1: Algorithm for the estimation of the fiscal impact of new technologies

Intro

This model represent the D9.1 of WP9: Expanding economic analysis for HTA: methods for measuring fiscal impact of new healthcare interventions.

Objective

Development of an algorithm for the estimation of the fiscal impact of health technology will be developed.

Results

Fiscal impact estimate: decrease of income tax revenues caused from lower pays after a sickness status.

Time horizon

Time horizon is up to retirement age.

Perspective

Cost and health outcomes are evaluated from the perspective of the third party payer.

Color coding and formatting

- Green cells with black border on input pages are user-modifiable and represent model inputs.
- Pale giallo cells represent a drop-down selection
- Pale blue cells contain calculations that are not user-modifiable.

Navigation: Home | **Description** | Population | Costs | Resource Use | Results | Determinist analysis | +

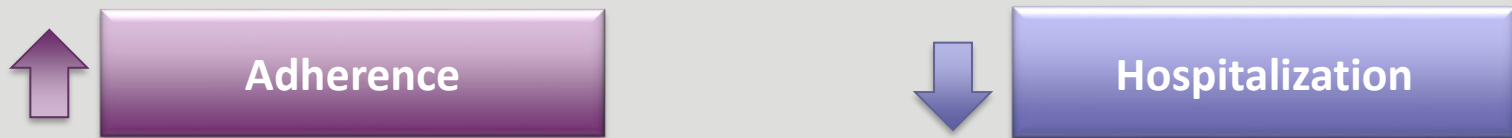
Pronto

A user-friendly checklist to conduct quick surveys aimed at investigating the fiscal impact

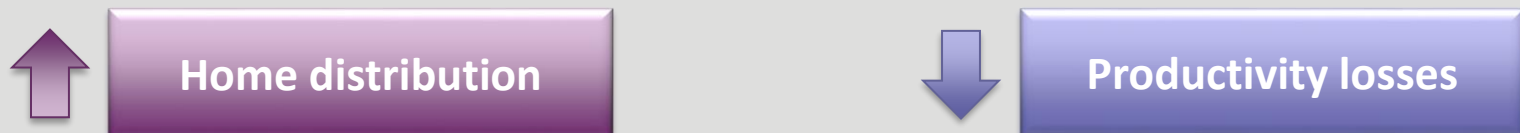
- Sample description:
 - Age (only people of working age 16-65 in Italy);
 - Sex;
 - Region;
 - Educational qualification;
- Description of the work activity:
 - Employee
 - Self-employed worker, freelance
 - Average weekly working hours
 - Income
 - Days lost due to a specific pathology
- Elements to determine the impact of a *health policy* that has an effect on measurable outcomes (e.g. reduction of complications, modification of a method of administration, etc ...).

Case-studies

- We investigate on the fiscal impact in two different scenarios:
- **Type 2 - diabetes:** we are assuming the implementation of a specific home telehealth programme able to increase the adherence to the treatments in the target population, reducing the incidence of the hospitalizations (-18%).



- **Ostomy and Intermittent catheterization:** we are assuming a different percentage in the distribution methods of ostomy and incontinence devices in the Italian clinical setting. In particular, we are assuming an annual increase in the 5% of the home distribution which affect the indirect costs in the target population.



First setting: Type 2 diabetes (T2D)

Results: base case

MEAN AGE	NUMBER OF PATIENT	FISCAL IMPACT	SOCIAL COSTS	TOTAL (FISCAL IMPACT + SOCIAL COSTS)	INCREASE IN TAX REVENUE (CUMULATIVE)	DECREASE IN PRODUCTIVITY LOSS (CUMULATIVE)
53	3,059,608	€ 205,764,143.31	€ 2,996,295,842.97	€ 3,202,059,986.28		
54	2,508,879	€ 204,163,926.05	€ 2,823,784,918.69	€ 3,027,948,844.73	€ 1,600,217.26	€ 172,510,924.29
55	2,057,281	€ 167,414,419.36	€ 2,315,503,633.32	€ 2,482,918,052.68	€ 38,349,723.95	€ 680,792,209.65
56	1,686,970	€ 137,279,823.87	€ 1,898,712,979.33	€ 2,035,992,803.20	€ 68,484,319.43	€ 1,097,582,863.65
57	1,383,316	€ 112,569,455.58	€ 1,556,944,643.05	€ 1,669,514,098.62	€ 93,194,687.73	€ 1,439,351,199.93
58	1,134,319	€ 92,306,953.57	€ 1,276,694,607.30	€ 1,369,001,560.87	€ 113,457,189.73	€ 1,719,601,235.67
59	930,141	€ 75,691,701.93	€ 1,046,889,577.98	€ 1,122,581,279.91	€ 130,072,441.38	€ 1,949,406,264.99
60	762,716	€ 62,067,195.58	€ 858,449,453.95	€ 920,516,649.53	€ 143,696,947.72	€ 2,137,846,389.02
61	625,427	€ 50,895,100.38	€ 703,928,552.24	€ 754,823,652.61	€ 154,869,042.93	€ 2,292,367,290.74
62	512,850	€ 41,733,982.31	€ 577,221,412.83	€ 618,955,395.14	€ 164,030,161.00	€ 2,419,074,430.14
63	420,537	€ 34,221,865.49	€ 473,321,558.52	€ 507,543,424.02	€ 171,542,277.81	€ 2,522,974,284.45
64	344,840	€ 28,061,929.71	€ 388,123,677.99	€ 416,185,607.69	€ 177,702,213.60	€ 2,608,172,164.98
65	282,769	€ 23,010,782.36	€ 318,261,415.95	€ 341,272,198.31	€ 182,753,360.95	€ 2,678,034,427.02

Results: bootstrap analyses (Fiscal Impact)

MEAN AGE	FISCAL IMPACT (BASE CASE)	10TH percentile	25TH percentile	50TH percentile	75TH percentile	90TH percentile
53	€ 205,764,143.31	€ 153,024,671.31	€ 178,006,982.18	€ 205,764,143.31	€ 233,521,304.43	€ 258,503,615.30
54	€ 204,163,926.05	€ 151,834,606.24	€ 176,622,630.95	€ 204,163,926.05	€ 231,705,221.14	€ 256,493,245.86
55	€ 167,414,419.36	€ 124,504,377.11	€ 144,830,557.38	€ 167,414,419.36	€ 189,998,281.34	€ 210,324,461.60
56	€ 137,279,823.87	€ 102,093,589.23	€ 118,761,057.05	€ 137,279,823.87	€ 155,798,590.70	€ 172,466,058.52
57	€ 112,569,455.58	€ 83,716,743.17	€ 97,384,066.78	€ 112,569,455.58	€ 127,754,844.37	€ 141,422,167.98
58	€ 92,306,953.57	€ 68,647,729.40	€ 79,854,934.76	€ 92,306,953.57	€ 104,758,972.38	€ 115,966,177.75
59	€ 75,691,701.93	€ 56,291,138.11	€ 65,481,046.50	€ 75,691,701.93	€ 85,902,357.36	€ 95,092,265.75
60	€ 62,067,195.58	€ 46,158,733.25	€ 53,694,458.13	€ 62,067,195.58	€ 70,439,933.03	€ 77,975,657.92
61	€ 50,895,100.38	€ 37,850,161.26	€ 44,029,455.67	€ 50,895,100.38	€ 57,760,745.09	€ 63,940,039.49
62	€ 41,733,982.31	€ 31,037,132.24	€ 36,104,153.65	€ 41,733,982.31	€ 47,363,810.97	€ 52,430,832.38
63	€ 34,221,865.49	€ 25,450,448.43	€ 29,605,405.99	€ 34,221,865.49	€ 38,838,325.00	€ 42,993,282.55
64	€ 28,061,929.71	€ 20,869,367.72	€ 24,276,432.91	€ 28,061,929.71	€ 31,847,426.50	€ 35,254,491.69
65	€ 23,010,782.36	€ 17,112,881.53	€ 19,906,674.99	€ 23,010,782.36	€ 26,114,889.73	€ 28,908,683.19

Second setting: Ostomy and continence care

Results: base case

MEAN AGE	NUMBER OF PATIENT	FISCAL IMPACT	SOCIAL COSTS	TOTAL (FISCAL IMPACT + SOCIAL COSTS)	INCREASE IN TAX REVENUE (CUMULATIVE)	DECREASE IN PRODUCTIVITY LOSS (CUMULATIVE)
50	101,235	€ 38,937,879.79	€ 422,862,381.92	€ 461,800,261.71		
51	96,174	€ 36,990,985.80	€ 401,719,262.82	€ 438,710,248.63	€ 1,946,893.99	€ 21,143,119.10
52	91,365	€ 35,141,436.51	€ 381,633,299.68	€ 416,774,736.19	€ 3,796,443.28	€ 41,229,082.24
53	86,797	€ 33,384,364.69	€ 362,551,634.70	€ 395,935,999.38	€ 5,553,515.11	€ 60,310,747.22
54	82,457	€ 31,715,146.45	€ 344,424,052.96	€ 376,139,199.42	€ 7,222,733.34	€ 78,438,328.96
55	78,334	€ 30,129,389.13	€ 327,202,850.32	€ 357,332,239.44	€ 8,808,490.66	€ 95,659,531.60
56	74,417	€ 28,622,919.67	€ 310,842,707.80	€ 339,465,627.47	€ 10,314,960.12	€ 112,019,674.12
57	70,696	€ 27,191,773.69	€ 295,300,572.41	€ 322,492,346.10	€ 11,746,106.10	€ 127,561,809.51
58	67,162	€ 25,832,185.00	€ 280,535,543.79	€ 306,367,728.79	€ 13,105,694.79	€ 142,326,838.13
59	63,804	€ 24,540,575.75	€ 266,508,766.60	€ 291,049,342.35	€ 14,397,304.04	€ 156,353,615.32
60	60,613	€ 23,313,546.97	€ 253,183,328.27	€ 276,496,875.24	€ 15,624,332.82	€ 169,679,053.65
61	57,583	€ 22,147,869.62	€ 240,524,161.86	€ 262,672,031.47	€ 16,790,010.17	€ 182,338,220.06
62	54,704	€ 21,040,476.14	€ 228,497,953.76	€ 249,538,429.90	€ 17,897,403.65	€ 194,364,428.16
63	51,968	€ 19,988,452.33	€ 217,073,056.08	€ 237,061,508.41	€ 18,949,427.46	€ 205,789,325.84
64	49,370	€ 18,989,029.71	€ 206,219,403.27	€ 225,208,432.99	€ 19,948,850.08	€ 216,642,978.65
65	46,902	€ 18,039,578.23	€ 195,908,433.11	€ 213,948,011.34	€ 20,898,301.56	€ 226,953,948.81

Results: bootstrap analyses (Fiscal Impact)

MEAN AGE	FISCAL IMPACT (BASE CASE)	10TH percentile	25TH percentile	50TH percentile	75TH percentile	90TH percentile
50	€ 38,937,879.79	€ 28,957,699.63	€ 33,685,239.63	€ 38,937,879.79	€ 44,190,519.95	€ 48,918,059.95
51	€ 36,990,985.80	€ 27,509,814.65	€ 32,000,977.65	€ 36,990,985.80	€ 41,980,993.96	€ 46,472,156.95
52	€ 35,141,436.51	€ 26,134,323.92	€ 30,400,928.76	€ 35,141,436.51	€ 39,881,944.26	€ 44,148,549.11
53	€ 33,384,364.69	€ 24,827,607.72	€ 28,880,882.33	€ 33,384,364.69	€ 37,887,847.05	€ 41,941,121.65
54	€ 31,715,146.45	€ 23,586,227.33	€ 27,436,838.21	€ 31,715,146.45	€ 35,993,454.69	€ 39,844,065.57
55	€ 30,129,389.13	€ 22,406,915.97	€ 26,064,996.30	€ 30,129,389.13	€ 34,193,781.96	€ 37,851,862.29
56	€ 28,622,919.67	€ 21,286,570.17	€ 24,761,746.48	€ 28,622,919.67	€ 32,484,092.86	€ 35,959,269.18
57	€ 27,191,773.69	€ 20,222,241.66	€ 23,523,659.16	€ 27,191,773.69	€ 30,859,888.22	€ 34,161,305.72
58	€ 25,832,185.00	€ 19,211,129.58	€ 22,347,476.20	€ 25,832,185.00	€ 29,316,893.81	€ 32,453,240.43
59	€ 24,540,575.75	€ 18,250,573.10	€ 21,230,102.39	€ 24,540,575.75	€ 27,851,049.12	€ 30,830,578.41
60	€ 23,313,546.97	€ 17,338,044.44	€ 20,168,597.27	€ 23,313,546.97	€ 26,458,496.66	€ 29,289,049.49
61	€ 22,147,869.62	€ 16,471,142.22	€ 19,160,167.41	€ 22,147,869.62	€ 25,135,571.83	€ 27,824,597.01
62	€ 21,040,476.14	€ 15,647,585.11	€ 18,202,159.04	€ 21,040,476.14	€ 23,878,793.24	€ 26,433,367.16
63	€ 19,988,452.33	€ 14,865,205.86	€ 17,292,051.09	€ 19,988,452.33	€ 22,684,853.57	€ 25,111,698.81
64	€ 18,989,029.71	€ 14,121,945.56	€ 16,427,448.53	€ 18,989,029.71	€ 21,550,610.90	€ 23,856,113.87
65	€ 18,039,578.23	€ 13,415,848.28	€ 15,606,076.11	€ 18,039,578.23	€ 20,473,080.35	€ 22,663,308.17

Comments

- The results show that an algorithm to calculate the fiscal impact due to a chronic condition can be implemented with the human capital approach.
- Straightforward methodology that can be generalized to other settings, need to know taxation schemes and days of absence from work.
- The fiscal impact framework doesn't account for disease – specific variables (i.e. disease specific scales, treatments...) and can be replied to other conditions.
- Indirect fiscal impact estimation (employees and consumption): difficult to estimate, individuals do not understand questions, high number of missing values or inconsistent responses, difficulties on the estimation of the outcomes of an assumed health policy and the cost of implementation of the policy itself.
- The resources dedicated to health become investments to the extent that they generate value for **individuals, the community and the economic system.**

Thank you!

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