

Saving healthcare and societal costs by changing the route of administration of oncology drugs

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Objective

In 2013 and 2014, the European Medicines Agency (EMA) approved the subcutaneous (SC) formulation of trastuzumab (Herceptin®) and rituximab (MabThera®), respectively. Both drugs were previously only administered intravenously (IV). In the context of continuously increasing expenditures, it is essential to optimize the allocation of healthcare resources. There is, however, limited evidence on cost associated with IV and SC administration of oncology drugs. We investigated healthcare and societal costs associated with SC injections and IV infusions of two oncology drugs (trastuzumab and rituximab) in The Netherlands.

Patients characteristics

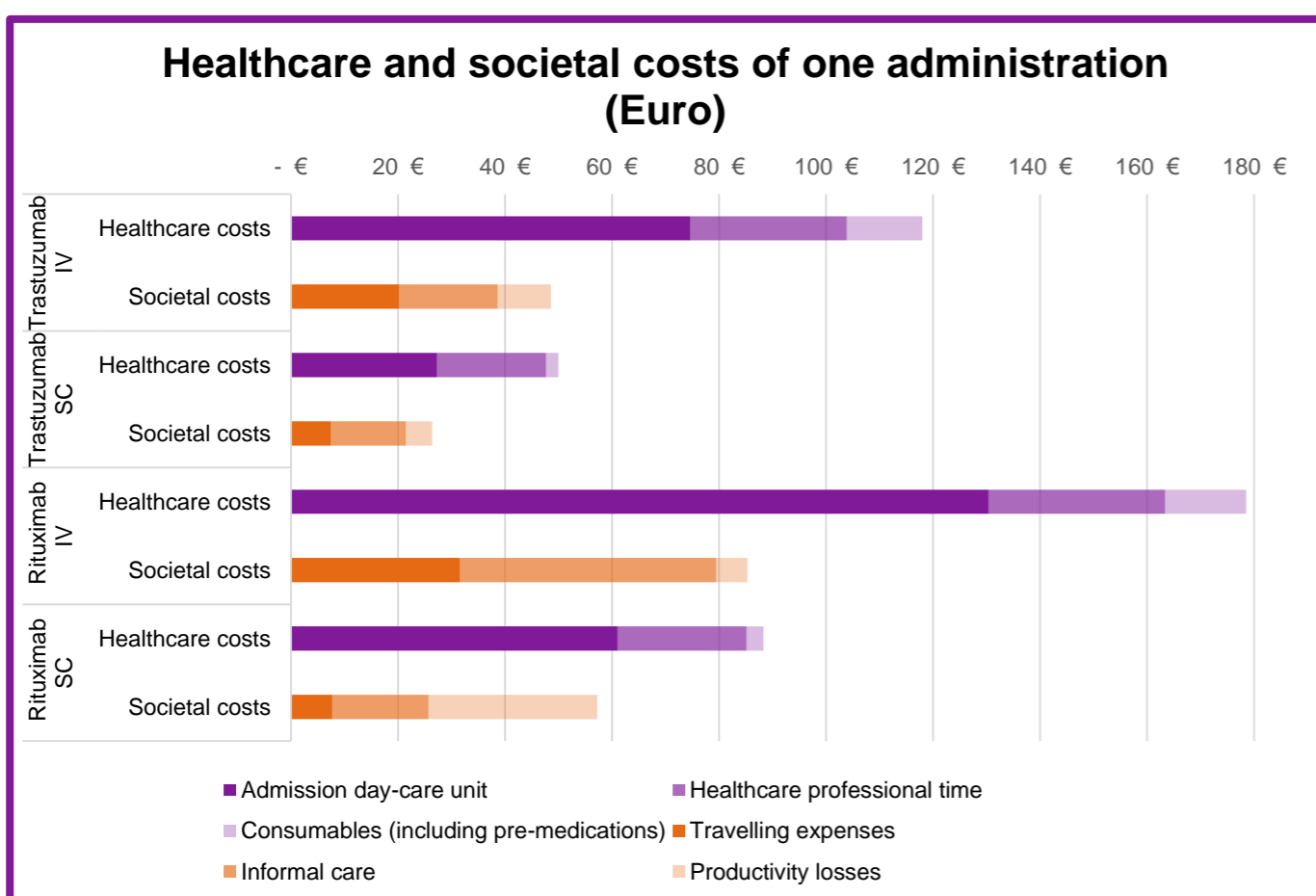
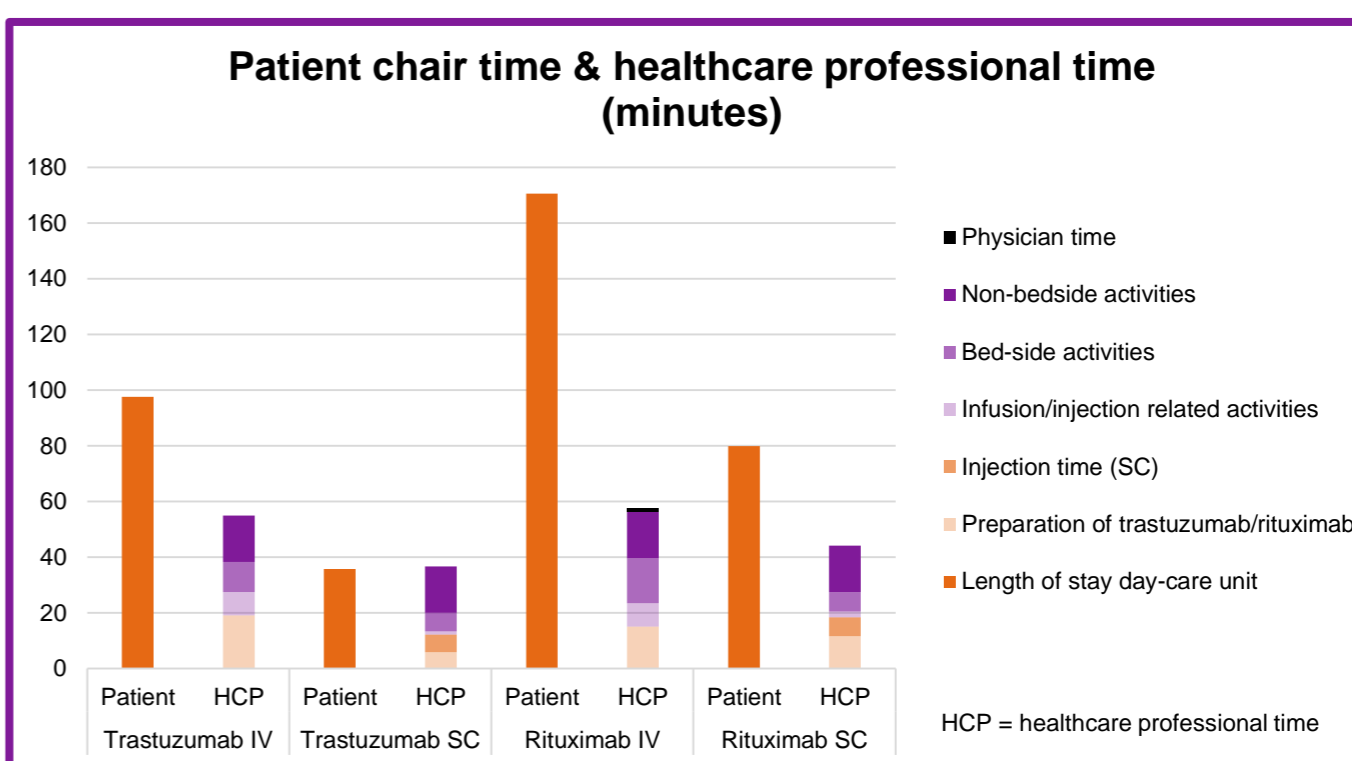
	All patients	Trastuzumab			Rituximab		
		All patients	IV	SC	All patients	IV	SC
Number of patients	126	82	37	45	44	23	21
Age, mean [SD]	58.1 [13.9]	53.5 [11.6]	53.3 [11.4]	53.6 [11.9]	66.7 [13.9]	72.9 [8.9]	59.9 [15.5]
Female	79.4%	98.8%	97.3%	100.0%	43.2%	47.8%	38.1%
Weight, mean [SD]	75.0 [12.9]	73.0 [12.6]	73.2 [15.2]	72.8 [10.2]	78.7 [12.9]	80.0 [13.6]	77.2 [12.1]
BSA, mean [SD]	1.88 [0.19]	1.84 [0.17]	1.84 [0.21]	1.84 [0.14]	1.95 [0.19]	1.96 [0.20]	1.93 [0.18]
First time trastuzumab/rituximab	7.1%	6.1%	8.1%	4.4%	9.1%	13.0%	4.8%
Number of IV therapies*							
Monotherapy	50.8%	52.4%	10.8%	86.7%	47.7%	56.5%	38.1%
Two therapies	20.6%	28.1%	56.8%	4.4%	6.8%	8.7%	4.8%
Three therapies	15.1%	9.8%	18.9%	2.2%	25.0%	17.4%	33.3%
Four therapies	13.5%	9.8%	13.5%	6.7%	20.5%	17.4%	23.8%
Accompanying informal caregiver	63.5%	56.1%	56.8%	55.6%	77.3%	91.3%	61.9%
Only for transportation	24.7%	21.3%	36.4%	8.0%	29.4%	42.9%	7.7%
Accompanied during admission	75.3%	78.7%	63.6%	92.0%	70.6%	57.1%	92.3%
Paid work	50.8%	62.2%	56.8%	66.7%	29.6%	8.7%	52.4%
> 12 weeks absent due to illness	80.3%	83.0%	82.6%	83.3%	69.2%	100.0%	63.6%
Unpaid work	27.8%	26.8%	37.8%	17.8%	29.6%	17.4%	42.9%
Mode of transportation to hospital							
Taxi	4.8%	4.9%	10.8%	0.0%	4.6%	8.7%	0.00%
Car	77.8%	76.8%	73.0%	80.0%	79.6%	82.6%	76.2%
Public transportation	7.9%	7.3%	8.1%	6.7%	9.1%	4.4%	14.3%
Biking / walking	9.5%	11.0%	8.1%	13.3%	6.8%	4.4%	9.5%
Travelling distance to hospital, mean	14.7 [11.5]	12.6 [9.3]	12.8 [9.3]	12.5 [9.4]	18.4 [14.2]	22.5 [16.3]	14.0 [10.2]

* including trastuzumab/rituximab

IV intravenous; SC subcutaneous; SD standard deviation

Methods

Data were collected for the preparation and administration of IV and SC trastuzumab (HER2+ metastatic breast cancer) and rituximab (non-Hodgkin lymphoma) at the hospital pharmacy and oncology day-care unit in six Dutch hospitals. Participation was voluntary; patients who were willing to participate signed an informed consent. For each patient, we registered healthcare professional time, patient chair time, and use of drugs and disposables. Patients completed questionnaires regarding productivity losses, informal care and travelling expenses. A correction for time and resource use was applied in case patients received a combination of different therapies. Costs were valued using the Dutch costing manual. Costs for time spent at the day-care unit were computed using the financial administration of participating hospitals.



Total healthcare costs of one administration stratified by duration of IV infusion and/or SC injection

Injection and/or infusion duration	Number of observations	Average number of therapies	Average total healthcare costs*
Duration 0-15 minutes (including SC injection)	47	1.00	€ 53.36
Duration 16-60 minutes	8	1.50	€ 111.49
Duration 61-90 minutes	12	2.17	€ 157.47
Duration 91-120 minutes	17	2.29	€ 195.76
Duration 121-180 minutes	22	2.41	€ 237.17
Duration >180 minutes	20	3.20	€ 318.96

* excluding drug costs

Main findings

- Total costs for one administration were €167 for IV trastuzumab and €76 for SC trastuzumab (excluding drug costs).
- Total costs for one administration were €264 for IV rituximab and €146 for SC rituximab (excluding drug costs).
- Administration costs are relatively small compared to oncology drug costs (irrespectively of mode of administration: about 10% of the total costs).
- Important healthcare and societal savings can be generated in The Netherlands by switching from IV to SC administration:

For trastuzumab, a full course (18 SC cycles) could generate €1,667 savings per patient. About 2,444 patients annually receive 40,392 cycles in The Netherlands. Consequently, switching to SC administration could yield a total of €3.740 million savings in The Netherlands (€96,133 drug costs, €2.747 million preparation and administration costs and €0.897 million societal costs).

For rituximab, a full course (1 IV and 7 SC cycles) could generate €1854 savings per patient. About 3673 patients annually receive 27,414 cycles in The Netherlands. Consequently, switching to SC administration could yield a total of €7,262 million savings in The Netherlands (€4.021 million drug costs, €2.472 million preparation and administration costs and €0.769 million societal costs).