



**BUSINESS
SCHOOL**

ONCOLOGY TRANSMURAL CARE

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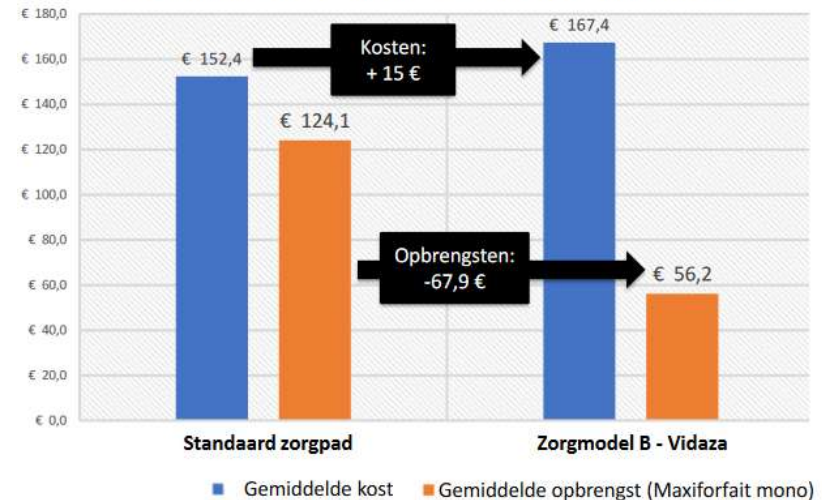
PREVIOUS RESEARCH

- A mixed view on the cost-effectiveness of Oncology at Home Hospitalisation (OHH). E.g.
 - The average cost of care for the home treatment group was lower (€2438.46) than for the hospital group (€2531.94) (Corrie et al, 2013).
 - Most recent research indicates that the average cost, direct and indirect, of OHH is higher than the average cost of hospital care (Cool, 2020).

HYPOTHESIS TO BE INVESTIGATED FROM OUR PRIOR LITERATURE REVIEW: HOME CARE IS NOT COST-BENEFICIAL FOR THE HOSPITAL

	Standaard zorgpad		Zorgmodel B - Vidaza	Zorgmodel B - Velcade	Verschil zorgmodel B vs standaard	
	FFT maxi mono subcutaan (Vidaza)	FFT maxi mono subcutaan (Velcade)	FFT maxi mono	FFT maxi mono	FFT maxi mono subcutaan (Vidaza)	FFT maxi mono subcutaan (Velcade)
KOSTEN TOTAAL ZH + THUIS	€ 152,4	€ 147,4	€ 167,4	€ 167,0	€ 15,0	€ 19,6
DAGZIEKENHUIS	€ 120,3	€ 121,8	€ 97,6	€ 92,0	-€ 22,7	-€ 29,8
KOST BEREIDING	€ 32,2	€ 25,6	€ 32,2	€ 25,6	€ 0,0	€ 0,0
THUISHOSPITALISATIE	€ 0,0	€ 0,0	€ 37,7	€ 49,4	€ 37,7	€ 49,4
OPBRENGSTEN, excl klin biol. en oncoloog	€ 124,1	€ 124,1	€ 56,2	€ 34,7	-€ 67,9	-€ 89,4
ZIEKENHUIS	€ 124,1	€ 124,1	€ 53,2	€ 31,0	-€ 70,9	-€ 93,1
Maxiforfait	€ 124,1	€ 124,1	€ 53,2	€ 31,0	-€ 70,9	-€ 93,1
Honorarium oncoloog	€ 30,4	€ 30,4	€ 13,0	€ 7,6	-€ 17,4	-€ 22,8
Klinische biologie - forfait	€ 113,0	€ 113,0	€ 48,4	€ 28,2	-€ 64,6	-€ 84,7
Klinische biologie - per test	€ 2,2	€ 3,8	€ 2,2	€ 3,8	€ 0,0	€ 0,0
THUISHOSPITALISATIE	€ 0,0	€ 0,0	€ 3,0	€ 3,7	€ 3,0	€ 3,7
RESULTAAT, excl. klin biol en oncoloog	-€ 28,3	-€ 23,3	-€ 111,2	-€ 132,3	-€ 82,8	-€ 109,1
IMPACT OP INKOMSTEN KLIN BIOLOGIE	€ 113,0	€ 113,0	€ 48,4	€ 28,2	-€ 64,6	€ 84,7
IMPACT OP HONORARIUM ONCOLOOG	€ 30,4	€ 30,4	€ 13,0	€ 7,6	-€ 17,4	-€ 22,8

Vergelijking standaard zorgpad en zorgmodel B – Vidaza
(gemiddelde kosten: toediening + bereiding chemo door apotheek)



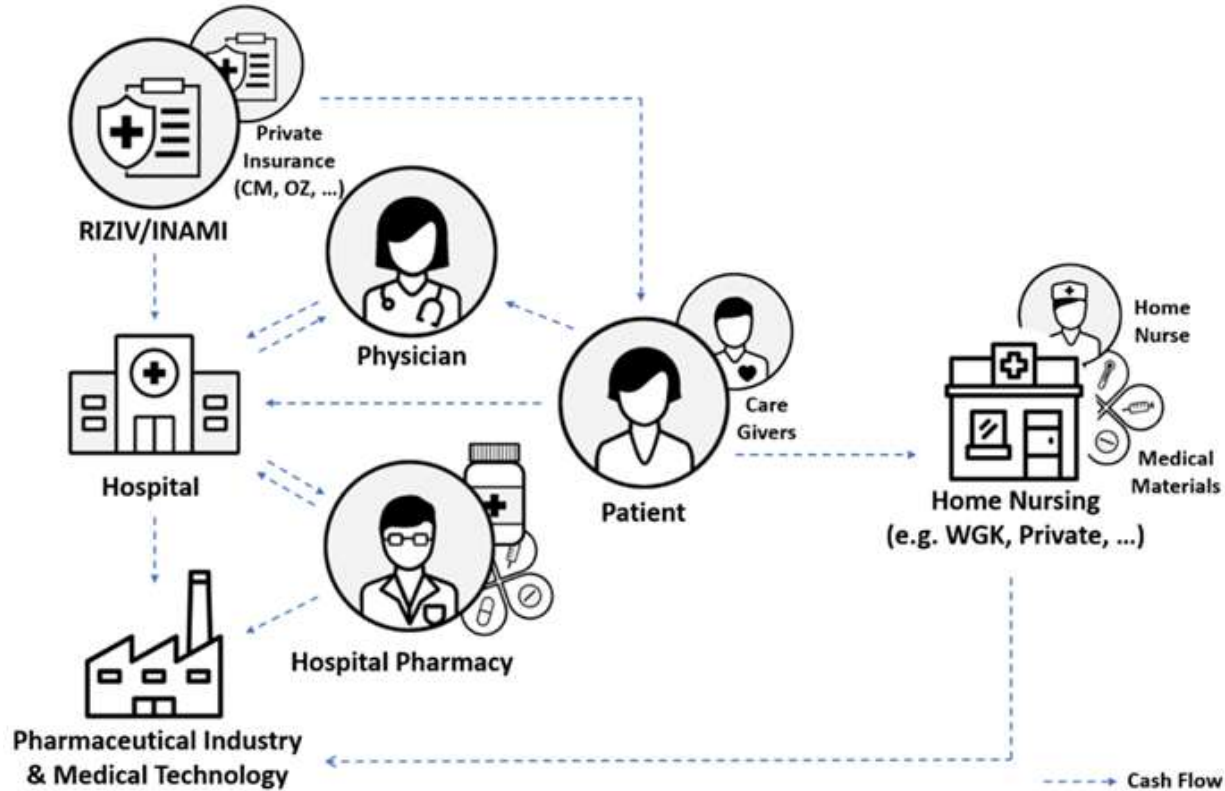
Kom Op tegen Kanker Onco@Home project (Annendijck, Neefs, Pelemans, Weemaes, and Misplon, (2021), 'Haalbaarheidsstudie Thuishospitalisatie', Kom op Tegen Kanker) to provide the most recent and best reference and basis to conduct our research.

But also: hospital management challenges implementing outpatient care and societal costs not studied yet

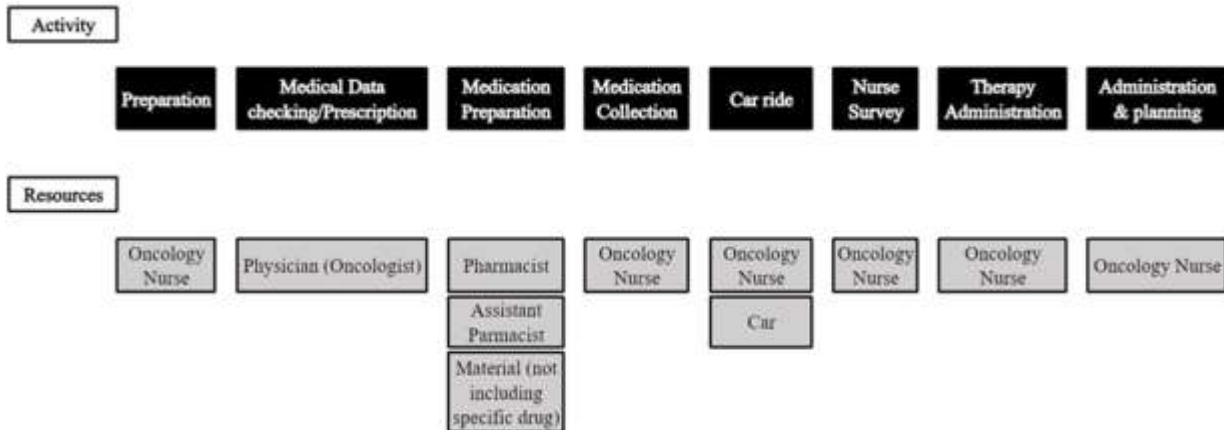
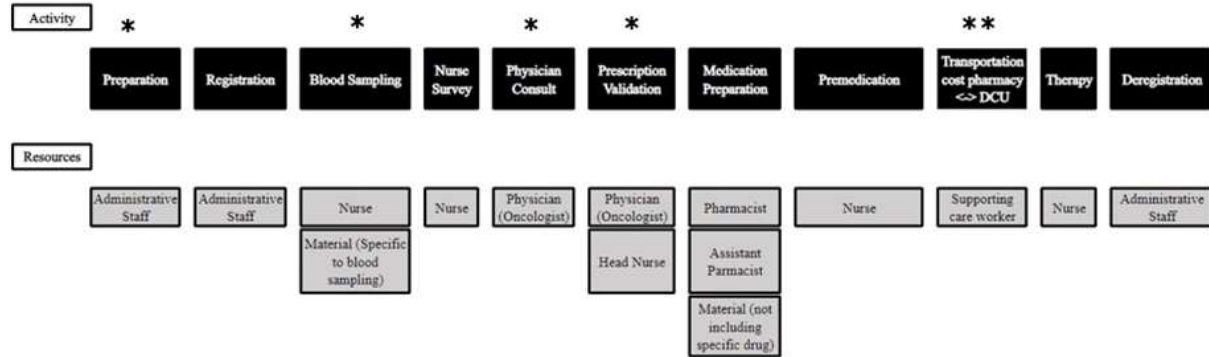
OUR RESEARCH FOCUS

- Can transmural care be made cost-effective for the HCP?
- Taking into consideration TD-ABC analysis of patient care flows (direct and indirect costs)
- What's the effect on top line, bottom line, and capacity use of the HCP

THE TRANSMURAL CARE ECOSYSTEM



WE USED THE FOLLOWING DEFINITION OF SOC (TOP FLOW) AND FULL OHH (BOTTOM FLOW)

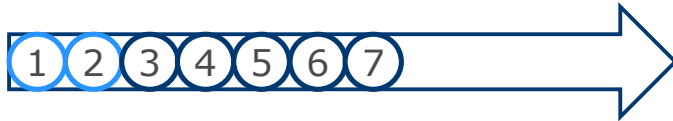


STUDY LIMITATIONS

- we were unable to conduct interviews with hospitals in order to validate the process maps and the care delivery value chain (CDVC) of the three models identified in the studies.
- Primary data collection based on different hospitals' perspectives as well as other stakeholders in the healthcare ecosystem would have been very useful and relevant.
- Moreover, if we could have access to this hospital data and resources, we would re-evaluate the various assumptions adopted in KOTK1 and Cool's studies (e.g. KCE manual wages and practical capacity⁴³), RIZIV/INAMI nomenclature²⁰). In our opinion, these assumptions have a great impact on the financial results of the models created and should be regularly updated to maintain an accurate costing system.
- Lastly, because OHH-patients (especially Full-OHH) receive 60% to 70% of their therapy treatments at home, hospital beds might become empty. In our report, we only focused on the capacity-gain (revenue/income) opportunity provided by OHH-models assuming that hospitals are always operating at full capacity. In order to determine the impact of OHH on hospitals, it would be also ideal to quantify the cost of a vacant hospital bed. However, we did not include this in this study.

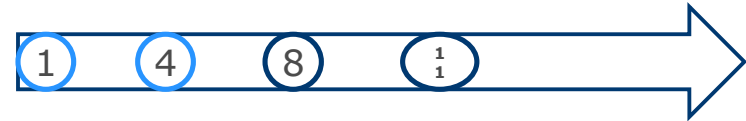
BASIS OF OUR ANALYSIS ARE TWO DIFFERENT ONCOLOGY @ HOME HOSPITALISATION (OHH) TREATMENT SCHEDULES FOR TWO MEDICINES

Treatment 1/Tx Schedule 1 (T1/S1)



- 1^{ste} & 2^{de} administration are done at the hospital (2 out of 7 days)
- Subsequent administration are done at the home (5 out of 7 days)

Treatment 2/Tx Schedule 2 (T2/S2)



- 1^{ste} & 2^{de} administration are done at the hospital (2 out of 4 days)
- Subsequent administration are done at the home (2 out of 4 days)

The difference in administrations places was used to spread the costs of cycles and arrive at the Avg. Cost/day

EVALUATING PERFORMANCE OF HOME CARE COMPARED TO DAY CARE FOR THE HOSPITAL

■ **Contribution margin=**

(Revenue – Variable cost)/Revenue

- Revenue= Maxiforfait (or not: with OHH), oncologist, clin biologist %
- Variable cost= total personnel cost including pharmacy, physician, clin biology, direct material

■ **Net margin=**

(Revenue – Total cost hospital incl. pharmacy)/Revenue

- Revenue= identical
- Total cost= total cost as above + indirect building cost + depreciation

FINDING 1: DROP IN HOSPITAL CONTRIBUTION MARGIN AND NET MARGIN FOR FULL OHH¹ IMPLEMENTATION, LESS TO NO NET MARGIN DROP IF OUTSOURCING IS CONSIDERED

Subcutaneous treatment P&L with Reimbursement proposals						
	SOC-model		FULL-model		FULL-model - outsourcing	
	Standard Reimbursement		Reimbursement proposal (Day 1 & 2 hospital)		Reimbursement proposal (Day 1 & 2 hospital)	
	T1S1	T2S2	T1S1	T2S2	T1S1	T2S2
Revenues (€)						
Total reimbursement in hospital	151,52	151,52	43,29	75,76	43,29	75,76
Total Reimbursement OHH	0	0	58,90	44,33	49,16	38,76
Total Revenue, excl. Clinical biology and oncologist	151,52	151,52	102,20	120,09	92,45	114,52
Total Revenue, incl. Clinical biology and oncologist	322,30	325,98	196,91	237,81	187,17	232,23
Costs (€)						
Total administration staff costs	9,05	9,05	2,59	2,59	2,59	2,59
Total nurse costs	30,87	32,03	14,46	16,01	14,46	16,01
Total head nurse costs- prescription validation	0,65	1,14	0,65	1,14	0,65	1,14
Total supporting care worker: DCU <-> Pharmacy	6,30	6,30	1,80	3,15	1,80	3,15
Total physician costs	56,78	56,78	56,78	56,78	56,78	56,78
Total Cost Clinical Biologie	52,76	54,60	15,07	27,30	15,07	27,30
Total personnel costs	156,41	159,90	90,80	108,06	90,80	108,06
Other cost hospital	31,47	32,48	8,99	16,24	8,97	16,24
Total cost hospital	187,89	192,38	99,79	124,30	99,77	124,30
Total Cost Pharmacy	37,16	37,16	43,02	37,16	43,02	37,16
Total Cost OHH			38,23	25,58		
Total cost per day per cycle	225,05	229,54	181,05	188,22	142,79	161,46
Total fixed costs	43,21	44,21	25,88	30,40	21,92	28,82
Total variable costs	181,84	185,33	149,30	156,64	115,02	132,64
Net Income (€)						
Total income, excl. Clinical biology and oncologist	-73,53	-78,02	-78,85	-68,13	(50,34)	(46,95)
Total income, incl. Clinical biology and oncologist	97,25	96,44	15,86	49,58	44,38	70,77
Margins (%) - excl. Clinical biology and oncologist						
Contribution margin	-20,01%	-22,31%	-46,09%	-30,44%	-24,40%	-15,83%
Net margin	-48,53%	-51,49%	-77,16%	-56,74%	-54,45%	-40,99%
Margins (%)						
Contribution margin	43,58%	43,15%	24,18%	34,13%	38,55%	42,89%
Net margin	30,17%	29,58%	8,06%	20,85%	23,71%	30,47%
Free capacity opportunity - Margin (%)						
Contribution margin	-	-	34,63%	37,80%	41,32%	42,99%
Net margin	-	-	19,98%	24,91%	27,27%	30,32%

FINDING 2: OPTIMIZING OHH DIFFICULT FROM HCP PERSPECTIVE

Subcutaneous treatment (Full-model with reimbursement proposal) T1S1 - On average 10,2 cycles & 7 treatments per cycle				
	Day (1 - 2)	Day (3-7)	Total	Average
Revenues (€)				
Hospital				
Maxiforfait - RIZIVnr.: 767874	138,94		277,88	39,70
Maxiforfait - RIZIVnr.: 590332	6,29		12,58	1,80
Maxiforfait - RIZIVnr.: 590310	6,29		12,58	1,80
Total Maxiforfait hospital	151,52	0,00	303,04	43,29
Fixed fee preparation/transportation/delivery of medicine & material by pharmacist		32,44	162,20	23,17
Fixed fee for the material necessary for the administration of the medicines (including emergency kit)		17,57	87,85	12,55
Fixed supervision fee for the physician (86,51€/treatment)			0,00	0,00
Fixed fee for care coordination by a nurse from the hospital OHH (14,85/treatment)		14,85	74,25	10,61
Fixed fee for care coordination by a nurse from the hospital (14,85/treatment)		14,85	74,25	10,61
Lump sum for initiating home hospitalization (196,81€/year)		2,76	13,78	2,76
Total revenue OHH	0,00	82,47	412,33	58,90
Total Revenue, excl. Clinical biology and oncologist	151,52	82,47	715,37	102,20
Honorarium - Oncologist	65,27	65,27	456,89	65,27
clinical biology laboratory - RIZIVnr.: 591076	61,40		122,8	17,54
clinical biology per administration - RIZIVnr.: 591091	39,20		78,4	11,20
clinical biology blood sample (B-value) - RIZIVnr.: 592911	4,91		4,91	4,91
Total Revenue, incl. Clinical biology and oncologist	322,30	147,74	1.378,37	196,91

*Car rides schedule can be optimized?
(at present: 15' travel time patient-to-patient) foreseen AND pharma material is stored at patient site*

Provided OHH can lead to more patients served leads to better capacity use which will increase the net margin

Costs (€)				
Hospital				
Preparation	3,02		6,04	0,86
Registration	3,02		6,04	0,86
Deregistration	3,02		6,04	0,86
Total administration staff costs	9,05	0,00	18,11	2,59
Blood sample	1,54		3,08	3,08
Nurse survey	5,52		11,04	1,58
Premedication	3,30		6,60	0,94
Therapy	20,51		41,03	5,86
Total nurse costs	30,87	0,00	61,74	8,82
Total head nurse costs- prescription validation	0,65		1,30	1,30
Total supporting care worker: DCU <> Pharmacy	6,30		12,59	1,80
Total physician costs	56,78	0,00	113,57	16,22
Total Cost Clinical Biologie	52,76		105,51	15,07
Total personnel costs	156,41	0,00	312,83	44,69
Material	1,70		3,40	0,49
Depreciation and other company costs (+3%)	1,41		2,81	0,40
Indirect costs: building, heating, maintenance, etc. (+56,6%)	28,29		56,58	8,08
Other cost hospital	31,39	0,00	62,79	8,97
Total cost hospital	187,81	0,00	375,61	53,66
Pharmacy				
Pharmacist	11,41	11,41	79,84	11,41
Pharmacist-assistant	7,68	7,68	53,73	7,68
Material	4,65	4,65	32,55	4,65
Other costs (depreciation, maintenance, etc.) (+56,6%)	13,43	13,43	94,03	13,43
Cost Pharmacy	37,16	37,16	260,15	37,16
OHH				
Personnel - Nurse				
preparation		4,92	24,62	3,52
Medication collection		8,21	41,03	5,86
Nurse fee		8,21	41,03	5,86
Nurse survey		4,92	24,62	3,52
Therapy		9,85	49,23	7,03
Administration		5,74	28,72	4,10
Personnel cost		41,85	209,23	29,89
transportation: car cost (8,61 km*2*0,3574€/km)		6,15	30,77	4,40
Indirect costs - 13,2% of wages		5,52	27,62	3,95
Cost OHH	53,52		267,62	38,23
Total fixed costs	43,13	18,96	181,03	25,86
Total variable costs	181,84	71,73	722,35	103,19
Total cost	224,97	90,69	903,38	129,05
Net Income (€)				
Total income, excl. Clinical biology and oncologist	-73,45	-83,06	-562,21	(80,32)
Total income, incl. Clinical biology and oncologist	97,33	-83,06	-225,56	(32,22)
Margins (%) - excl. Clinical biology and oncologist				
Contribution margin	-30,01%	-840,74%	-111,73%	-111,73%
Net margin	-48,48%	-1089,34%	-164,79%	-164,79%
Margins (%)				
Contribution margin	43,58%	-840,74%	-6,57%	-6,57%
Net margin	30,20%	-1089,34%	-33,28%	-33,28%

FINDING 3: FILLING UP FREE CAPACITY WITH OTHER SOC OR HIGHER ADDED VALUE COULD COMPENSATE FOR CONTRIBUTION MARGIN LOSSES

Subcutaneous treatment P&L with Reimbursement proposals

	SOC-model		FULL-model		FULL-model - outsourcing	
	Standard Reimbursement		Reimbursement proposal (Day 1 & 2 hospital)		Reimbursement proposal (Day 1 & 2 hospital)	
	T1S1	T2S2	T1S1	T2S2	T1S1	T2S2

Margins (%)

Contribution margin	43,58%	43,15%	24,18%	34,13%	38,55%	42,89%
Net margin	30,17%	29,58%	8,06%	20,85%	23,71%	30,47%

Free capacity opportunity - Margin (%)

Contribution margin	-	-	34,63%	37,80%	41,32%	42,99%
Net margin	-	-	19,98%	24,91%	27,27%	30,32%

PRELIMINARY CONCLUSIONS FROM OUR TDABC¹ ANALYSIS REQUIRING YOUR FEEDBACK AND DISCUSSION

- Contribution and net margins are good criteria to judge financial benefit of a Tx, which is product- and schedule-specific
- Currently only 5-10% of patients are served in OHH¹. Increasing this % would release hospital beds for more complex interventions
 - Conversion rate: e.g. given a specific TiSi treatment schedule; 1 patient OHH releases for example 2,33 day care beds capacity, within existing nursing capacity
- Given the higher share of (IV-directed) immunotherapies, it could make sense to shift oncology in-house capacity use to these novel therapies and shift more chronic use of subcutaneous Tx to OHH, through a specialized organisation.
- From interviews: Patients are very satisfied with OHH to the point they don't want to switch back to hospital-bound care anymore.
 - So, is it an option for Mutuality or private healthcare insurance to foresee increased co-pay insurance?

OUR CONCLUSIONS

- OHH¹ with actual reimbursement cannot be organised in the hospital to match the present SOC² contribution margins. The provided extra patient satisfaction can only be realized at an extra cost to the hospital
- OHH can be made to work for a hospital by (1) collaborating with an outside OHH HCP organisation, (2) provided the freed-up capacity is used for higher margin-generating activity.
- From our simulations;
 - The hospital will then be able to extend its capacity, realizing the same margins or higher as under SOC
 - The OHH HCP offers a better-focused factory than a hospital to provide home care services, i.e. they are better equipped to realize this efficiently.

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