The lifetime costs and benefits of subsidizing the cost of nicotine replacement therapy in Sweden

Should nicotine replacement therapy be provided free of charge?

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LISBON ADDICTIONS 2022

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Background

- 7 % Swedes are smoking daily.
- The prevalence is higher (12%) among people with low education compared to among people with university level education (4%).
- Evidence on the effectiveness of nicotine replacement therapy (NRT) exists.
- International studies reported favourable cost-effectiveness results on NRT compared to unaided smoking cessation.
- NRT is not included in the pharmaceutical benefits scheme in Sweden

Aim

This study aims to assess the cost-effectiveness of subsidizing NRT in Sweden.

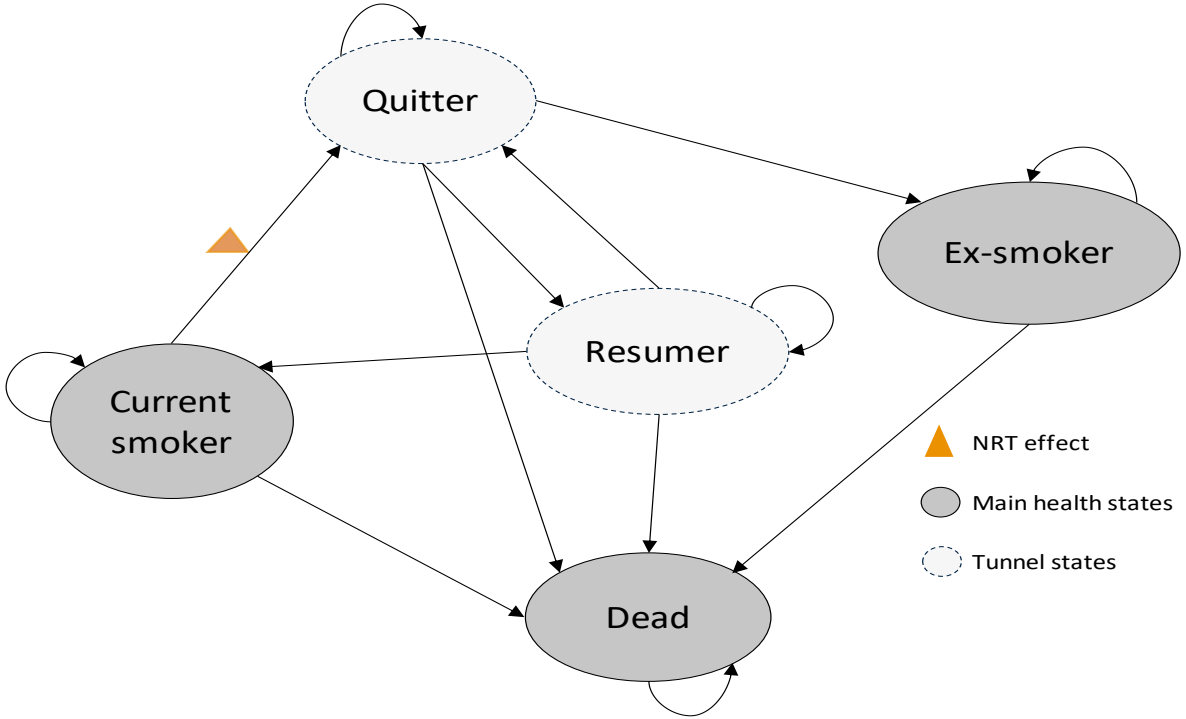
- Paying out of pocket to buy NRT over the counter can hinder the use
- Results will support decision making!

Method

- A homogeneous cohort-based Markov model was developed to assess the lifetime costs and effects of subsidized NRT
- Perspectives - payer and societal,
- Data were retrieved from the literature and national statistics
- Selected parameters are varied in a deterministic and probabilistic sensitivity analyses
- Costs – USD, 2021

Modelling framework

Mortality-based Markov model



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Direct costs (NRT)

- Subsidization was defined as region Stockholm covering the entire cost of NRT for a three-month treatment period.
- In the “current practice” alternative, smokers are free to buy NRT over the counter and “self-treat” themselves
- All have available health care services including ‘a toll-free telephone-based counselling, at their disposal.

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Model parameters - epidemiology

Parameters	Age	Smokers	Resumers	Quitters	Ex-smokers	Source
NRT effect RR (CI)		1.55 (1.49-1.61)	--	--	--	Hartmann-Boyce et al, 2018
Relapse rate, %		--	--	10 (5-17)	10 (5-17)	Hughes et al, 2008
Mortality*, RR (CI)	Men	2.75 (2.54 - 2.99)	1.6 (1.34 - 1.92)	1.51 (1.34 - 1.71)	1.11 (1 - 1.24)	Bjartveit & Tverdal, 2009
	Women	2.49 (2.3 - 2.7)	1.37 (1.06 - 1.77)	1.65 (1.39 - 1.95)	1.01 (0.85 - 1.19)	
Utility weights, mean(SE)	16–24	0.92 (0.01)	Same as smokers	Same as ex-smokers	0.94 (0.01)	Vogl et al, 2012
	25–34	0.92 (0.01)	--	--	0.94 (0.01)	
	35–44	0.90 (0.01)	--	--	0.93 (0.01)	
	45–54	0.86 (0.01)	--	--	0.88 (0.01)	
	55–64	0.80 (0.01)	--	--	0.83 (0.01)	
	65–74	0.78 (0.01)	--	--	0.81 (0.01)	
	75–100	0.72 (0.01)	--	--	0.75 (0.01)	

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Model parameters - costs

	Age	Smokers	Resumers	Quitters	Ex-smokers	Source
Direct costs	18–24	385	Same as smokers	Same as ex-smokers	130	Andersson et al, 2017
	25–44	407	--	--	138	
	45–64	661	--	--	224	
	65–79	1 181	--	--	400	
	80+	1 660	--	--	563	
Indirect costs	18–24	864	Same as smokers	Same as ex-smokers	268	Andersson et al, 2017
	25–44	914	--	--	284	
	45–64	1 483	--	--	460	
§Average annual wage	18–24	36 357	Same	Same	Same	Statistiska centralbyrån (SCB)
	25–34	45 307	--	--	--	
	35–44	52 578	--	--	--	
	45–54	55 934	--	--	--	
	55–64	54 256	--	--	--	

Analisys

- Base case:
  - Cohort of 1000 smokers aged 16-100 (using different start ages), until they reach 100 years old or die (whichever comes first) , 1000 Monte-Carlo simulations
  - The results are presented as costs, QALYs and ICER (incremental costs effectiveness ratio) as cost per QALYs gained per person
- Sensitivity analyses
  - Several deterministic and probabilistic sensitivity analyses (PSA)

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Results

- Base case
  - Subsidized NRT provided 0.036 (0.025 to 0.047) QALYs per person over a lifetime compared to the current practice.
  - It was also associated with a reduction of USD -262 (-590 to 84) per person with a 98% of probability being the cost saving alternative from a societal perspective.
  - From a healthcare perspective, NRT is associated with an incremental cost of USD 518 (445 to 582) per person, which results in an ICER of 14 480 USD per QALY.

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Results

- Base case - separate age groups:
  - From a societal perspective the ICER increases with age.
  - Subsidizing NRT in the younger population is more economically attractive for the society while for the healthcare payer subsidizing the older population is much more favourable

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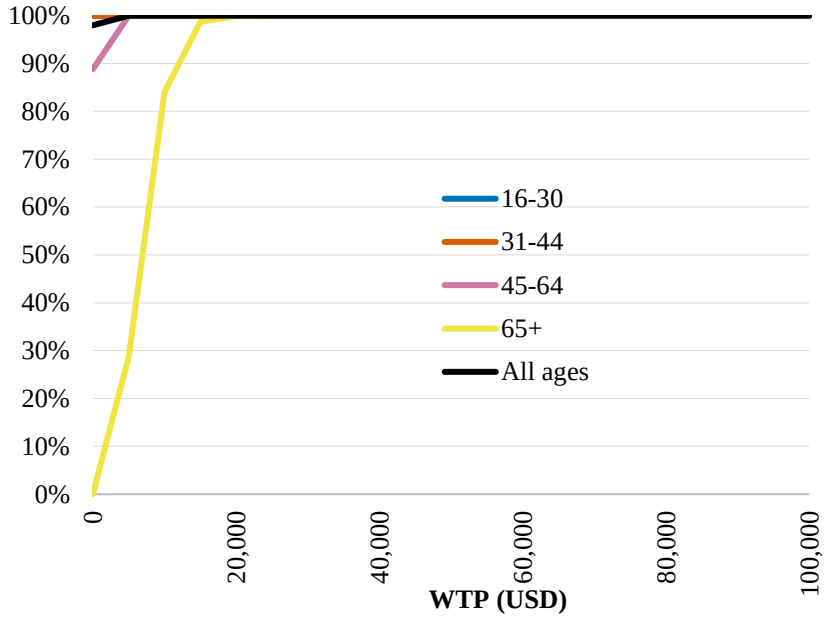
Results - PSA

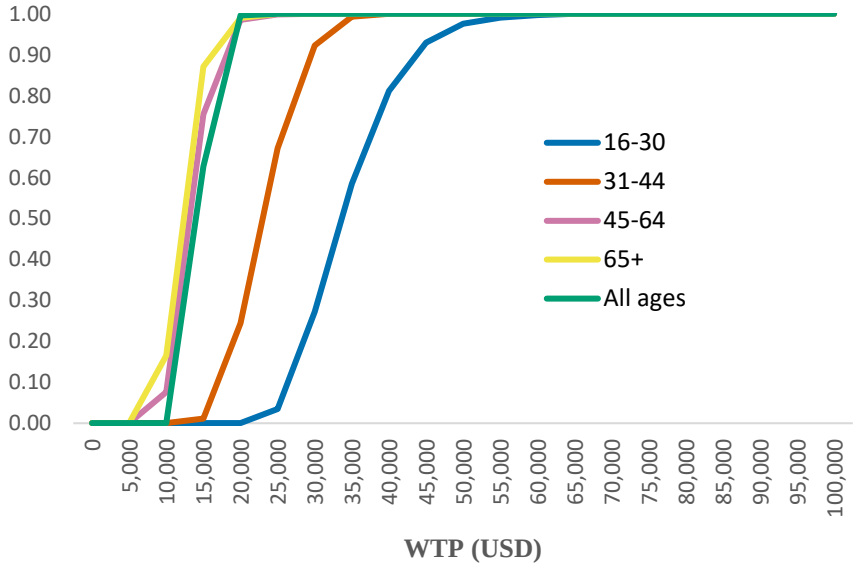
- NRT has shown a 98 % probability of being cost saving from a societal perspective (and 100% cost effective at a WTP of USD 50 000 per QALY)
- The NRT is 0 % cost saving but 100 % cost effective at a WTP of 50 000 USD per QALY from a healthcare payer perspective

Results - PSA

Societal perspective



Payer perspective



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Conclusions

- Subsidizing NRT is potentially a cost-saving smoking cessation alternative compared to current practice from a societal perspective.
- From a healthcare payer perspective, subsidizing NRT is estimated to cost USD 14 480 to gain an extra QALY.
- Introducing subsidized NRT seems to be a good use of resource for the society as well as the healthcare sector.
- Moreover, subsidizing NRT might contribute to reducing health inequalities by removing the financial barriers.
- Future economic evaluations can further investigate the health inequality impacts with methods that are more suitable for this.

Limitations

- Economic models are vulnerable to uncertainties associated with the data inputs, model structure and methodological choices
- Data inputs including smoking related mortality, quality of life weights and relapse rates are taken from the literature and might not reflect the current Swedish context

Thank you!