Final Report Summary - EQUIPT (European-study on Quantifying Utility of Investment in Protection from Tobacco)

Executive Summary:
Context and aims: Protection from tobacco has been a global public health agenda, as tobacco smoking worldwide accounts for millions of deaths both directly and as the result of second-hand smoke. The Framework Convention on Tobacco Control (FCTC) is a comprehensive response to address the scourge of tobacco, of which most EU member states are signatories. Despite the availability of many cost-effective interventions to tackle tobacco use, decision makers in the EU member states and beyond still lack the justification on the economic and wider returns that their tobacco control agenda could generate. Therefore, the EQUIPT study aimed to fill in this important gap by providing European stakeholders with a decision-support tool to estimate the return on investment (ROI) from investing in tobacco cessation interventions. This was done by transferring the existing ROI Tool that was jointly developed by the Brunel University London and the National Institute of Health and Care Excellence in the UK in 2012 to five European countries. In transferring the ROI evidence and tools, the EQUIPT researchers carefully examined several transferability issues, using a methodology that was grounded on the co-creation of research evidence with strong stakeholder partnership.

Methods: The EQUIPT study was organised in 6 working packages (WP). Pre-adaptation studies (WP1) included understanding of local decision contexts and tool-adaptation needs with the help of a desk review; the interviews with 93 stakeholders (decision/policy makers, healthcare purchases, academics/researchers, health advocates, and others) from five countries (Germany, Hungary, Spain, the Netherlands and the UK); and a parameter importance analysis based on the underlying economic model. The outcome of this work fed into tool adaptation work (WP2) which included standardised parameter collection, iterative validation by countries, piloting and usability assessments, and the final model validation by an independent, external expert. Four distinct smoking related diseases (CHD, COPD, Lung Cancer and Stroke) were included in the ROI tool with consideration of smokers in two categories: those who would make a quit attempt in the next 12 months and those who would not. Interventions either encouraged smokers to make a quit attempt (movement between categories) or enhance chances of quitting in those considering making an attempt. The model enabled comparison between alternate packages- Current Investment and Prospective Investment - compared to each other and to a no investment scenario. Transferability of the tool to further three countries (Romania, Bulgaria and Croatia) was studied using parameter uncertainty analysis leading to the collection of additional data from those countries (WP3). Two stakeholder workshops (London and Zagreb) with pre- and post-meeting surveys, coupled with an exemplar analysis of the ROI of current and prospective tobacco control scenarios across five countries, were conducted to evaluate policy proposals (WP4). The final tool (available as both Excel- and web-based tools) and dissemination/support materials including the user guides (WP5) were made available via the EQUIPT website (http://equipt.eu). The tool can be used to estimate the ROI of several prospective scenarios such as the ones included in the exemplar analysis. Ethical clearance was obtained from the Brunel University London Ethics Committee and respective authorities in participating countries; various activities across all working packages were coordinated effectively to achieve the study’s overarching aim; and the final results were discussed with stakeholders at the End of the Project Conference (WP6).
Results: The decision contexts in which the tool was being transferred differed in five key domains: each country’s population, smoking prevalence, perspective on tobacco use and control, current policy instruments and the level of progress made on the implementation of FCTC. Stakeholders considered it important that decisions on the investment in tobacco control should be supported by scientific evidence around cost of smoking, quality of life, smoking-attributable mortality, and effectiveness, cost-effectiveness and budget impact of smoking cessation interventions. The proposed ROI tool was required to provide this granularity of information. Generally, stakeholders’ answers showed larger variability by country than by stakeholder category. Although nearly two-thirds of the interviewed stakeholders were intending to use the ROI tool, significant differences in stakeholders’ beliefs (e.g. in risk perception, attitude, social support, and self-efficacy) were found between non-intenders and intenders of the proposed ROI tool. Stakeholders’ views on the importance of various types of tobacco cessation interventions varied within and between countries, and in some cases, differed from the ranking suggested by established cost-effectiveness evidence. Parameter uncertainty analysis identified 16 sets of model parameters (out of 49 sets) as key parameters facilitating transferability of the ROI tool. Those, if collected for a local context, would make the EQUIPT Tool transferable to that context. Those parameters were, for example, smoking prevalence, costs of smoking-related diseases, discount rates and a few general attributes of the population.

This analysis showed that government actions, including maintaining a national network of stop-smoking services and adequately funding mass media campaigns, could save €829m this year across 5 EU countries. Savings come from reduction in costs of treating four diseases caused by smoking – lung cancer, coronary heart disease, chronic obstructive pulmonary disease and stroke (€475m) - and productivity gains (€322m) resulting from 3m fewer days of smoking-related absenteeism. An additional €32m of savings come from reductions in healthcare costs because of fewer non-smokers inhaling other people’s smoke. Every € spent in the current provision would provide a return between €3 and €9 over lifetime, depending on the country and what willingness-to-pay threshold for a QALY gain was used.

In addition, a change in current provision through scaling up of more effective intervention(s) – although required additional (upfront) investment costs - was found to be even more cost-effective using the respective country’s cost-effectiveness threshold value (this was assumed for Germany). Stakeholders found the EQUIPT ROI Tool a useful tool to write reports and business cases. There was very high level of consensus among stakeholders that the tool is able to support country-level policy decisions. The need for training to use the tool was highlighted in the stakeholder workshops.

Conclusion: Despite significant variation in decision contexts including stakeholders’ views on what is important to consider, it is possible to transfer the return on investment (ROI) concepts, evidence and tools to EU member states to help them understand the economic and wider returns that their tobacco control agenda could generate. Although the current provision of tobacco cessation is found to be cost-effective in all study countries (compared to doing nothing), the value of the EQUIPT ROI Tool lies in its ability to produce evidence-based justifications around how the current practice could be improved to provide even better value for money. The EQUIPT ROI Tool is a freely available resource for the European decision makers to use to explore alternative approaches.

Project Context and Objectives:
Project Context: Protection from tobacco has been a global public health agenda, as tobacco smoking worldwide accounts for 5 million deaths directly, with a further 600,000 deaths among non-smokers as the result of second-hand smoke. In the EU alone, 28% of the population smokes resulting in considerable smoking-related socio-economic inequalities with nearly 700,000 premature deaths every year (1). The health impact of smoking [e.g. coronary heart diseases (CHD), chronic obstructive pulmonary disease (COPD), lung cancer and stroke] (2) and wider consequences (e.g. productivity losses) have been well recognised (3). Tobacco use is estimated to cost the European Community about 1% of their GDP annually (4). The WHO Framework Convention on Tobacco Control (WHO FCTC) recommends that countries should implement evidence-based, comprehensive tobacco control measures (5). The WHO FCTC has been ratified by most EU member states and so efforts have been increasingly directed towards tackling tobacco smoking at all levels across the European Community through evidence-based interventions (6).
Co-ordinated, high impact and comprehensive approaches are the most effective way to reduce smoking initiation, prevalence and intensity of consumption (7-8). In order for the policy makers and public health procurers to implement such approaches, robust financial justification is needed to help them make the case for comprehensive or other, more focused investments to tackle the scourge of tobacco. The newly-implemented Health and Social Care (2012) Act in England, for example, has transferred health prevention roles from the National Health Service to Local Authorities (9). As the public budget has shrunk as the result of austere climate, the demand for information relating to the cost-effectiveness and return on investment (ROI) of tobacco control measures is on the rise (10). This study (EQUIPT) has evolved in the context of funding changes that have been observed since 2008 financial crisis (11). The initial work conducted by Brunel University London and the National Institute for Health and Care Excellence (NICE) in England together with three regional Smokefree Offices led to the NICE being able to publish a Return on Investment (ROI) Tool to help local decision makers count the cost of tobacco and implement services to address that (12). The ROI tool is essentially a Markov model implemented in Microsoft Excel and is designed to provide measures of uncertainty around the ROI estimates via probabilistic sensitivity analysis. The tool’s focus was to answer primarily the following two questions: (a) If I were to invest money in providing several interventions now in the anticipation (based on current practice) that a certain number of smokers would eventually take up those interventions, what would be the extent of the return on my investment ‘package’ in short, medium and long terms; and (b) What if I change the allocation of services (i.e. shift the pattern of current uptake)? (11)

Given the NICE tool is being used to inform tobacco control policies and strategies in England (13), the question as to whether (and how) such a research-led decision-support tool would be transferable to other European member states is timely. In an era of significant constraints on the public purse, it was envisaged that this tool could “contribute to making a powerful case for public health investments” (11). However, it was recognised that the scarcity of relevant input data posed a significant challenge to the adaptation of the tool to other countries (14-17) and therefore a collaborative, comparative effectiveness research study to investigate the roll out of the tool was set up. Full details of this study have been described elsewhere (11).

Main Objectives: The overarching aim of EQUIPT was to provide healthcare policy makers in the EU with bespoke information about the potential economic and wider returns to be expected from investing in evidence-based tobacco control agendas (11). EQUIPT had the ultimate ambition of underpinning health authority decisions on the development and/or harmonisation of new strategies for tobacco control projects for health promotion and disease prevention in the EU by disseminating the ROI concept and tools across Europe. In the first instance, it tested the applicability and implementation of the already developed ROI tool in four other EU Member states (known as ‘sample countries’- Germany, Hungary, the Netherlands and Spain). Next, it tested the transferability of the ROI methods to guide comprehensive tobacco control policies in three Central and Eastern European countries (known as ‘out-of-sample’ countries- Bulgaria, Croatia and Romania). In doing so, EQUIPT was developed as a multi-centre, inter-disciplinary, comparative effectiveness research (CER) study in public health (11). The NICE Tobacco ROI tool – which is a practical, customisable economic model developed in England to help make real-world decisions in the context of local government decision-making – was adapted to meet the needs of European decision makers. Locating itself in the theory of diffusion of innovation (18) and transferability of economic evidence (15), EQUIPT has thus co-created the EQUIPT ROI Tool (http://equipt.eu/deliverables) to compare the cost-effectiveness of tobacco-control strategies both within and across several EU countries.

The choice of sample countries was deliberate and represented a wide array of potential transferability factors. Geographically, this sample covered the whole continuum from West to East and North to South and included a wide range of cultural, behavioural, economic and other issues considered to be important when transferring evidence from one country to another (11).

EQUIPT considered two specific groups of interventions. An intervention that would either encourage smokers to make a quit
To implement the objectives, the study was organised in 6 working packages (WP). Pre-adaptation studies (WP1) included understanding of local decision contexts and tool-adaptation needs with the help of a desk review; the interviews with 93 stakeholders (decision/policy makers, healthcare purchases, academics/researchers, health advocates, and others) from five countries (Germany, Hungary, Spain, the Netherlands and the UK) (20-22); and a parameter importance analysis based on the underlying economic model. The outcome of this work fed into tool adaptation work (WP2) which included iterative validation by countries, piloting and usability assessments, and the final model validation by an independent, external expert. Four distinct smoking related diseases (CHD, COPD, Lung Cancer and Stroke) were included in the ROI tool with consideration of smokers in two categories: those who would make a quit attempt in the next 12 months and those who would not (19).

Transferability of the tool to further three countries (Romania, Bulgaria and Croatia) was studied using parameter uncertainty analysis leading to the collection of additional data from those countries (WP3). Two stakeholder workshops (London and Zagreb) with pre- and post-meeting surveys (23), coupled with an exemplar analysis of the ROI of current and prospective tobacco control scenarios across five countries (24), were conducted to evaluate policy proposals (WP4). The final tool (available as both Excel- and web-based tools) and dissemination/support materials including the user guides (WP5) were made available via the EQUIPT website (http://equipt.eu). The tool can be used to estimate the ROI of several prospective scenarios such as the ones included in the exemplar analysis. Various activities across all working packages were coordinated effectively to achieve the study’s overarching aim and the final results were discussed with stakeholders in the End of the Project Conference (23) (WP6).

Stakeholder engagement throughout the study was a key feature of the EQUIPT. Key stakeholders were identified right from the beginning (11) and were invited to provide inputs to all stages of the research: from needs identification (including the need for a user- friendly interface) to piloting and testing of ROI concepts and tools in local setting; from drawing policy implications to testing transferability assumptions and creating effective dissemination plans.

Usual ethical issues – maintaining confidentiality, anonymity and data protection for primary data (e.g. stakeholder interviews) and overall good research practice – applied to EQUIPT. The Brunel University London Research Ethics Committee (UK) reviewed this research and gave full ethical clearance. Respective authorities in sample countries (Ethik-Kommission, Bayerische Landesärztekammer from Germany, Egészségügyi Tudományos Tanács, Tudományos és Kutatásitkai Bizottság from Hungary, Parc de Salut MAR - Clinical Research Ethics Committee from Spain and Medisch-ethische toetsingscommissie (METC) a2M/UM from the Netherlands) also provided clearance. Full compliance was observed.

Project Results:
Main S&T results/foregrounds are described below as the following sub-studies:

Sub-study 1: Understanding the variability of decision contexts across the sample countries

This sub-study used desk-top review method to identify contextual factors that could affect transferability of the economic evidence from one context to the other. Although a vast body of published economic research provides evidence for investing in smoking cessation and prevention (7-8), studies as to what makes such evidence transferable to contexts other than where they were first generated are sparse. Full details of this review are described elsewhere (25).

This sub-study answered the following question:
Analysis 1.1: What are the main contextual factors affecting transferability of ROI tool?

The aim of this analysis was to map the variability of contextual factors that could be important to transfer a Tobacco Return on Investment (ROI) model from England to four additional European countries (Germany, Hungary, Spain and the Netherlands). Scopus, Medline, Web of Science (WoS), governmental and non-governmental reports, published databases and article reference lists were searched to identify data that would support ‘contextual visualisation’ defined by a pre-determined list of domains (population, prevalence, perspective, policy and progress – the 5Ps). Available data in each domain across the five European countries were comparatively mapped to identify any major similarities and differences that could potentially impinge on the transfer of economic evidence related to smoking cessation and prevention.

Variations in population (8:1) and relative wealth (almost 2:1 GDP in PPS) included levels both higher and lower than EU28 averages. Latest mortality data (all causes and deaths attributable to smoking (2004)) was quite dated and later mortality data (all causes, 2010-2012) had shown substantial falls since 2004. Prevalence in adults varied between 18% for current smokers in England to 31.2% in Hungary, with large percentages of former smokers in Netherlands and the UK. Data for prevalence in children (aged 15yrs, 2009/10) showed the percentage of males who smoked was greater than females only in Hungary.

Similarities in perspectives/attitudes included for: the ages when the majority of smokers started smoking; the main influence on them starting to smoke; the factors influencing their choice of cigarettes; their relative likelihood of being exposed to second-hand smoke in restaurants; the proportion of smokers that made a quit attempt and; their main reason for their quit attempt. Substantial differences in perspective were found for: price as a factor influencing their choice of cigarette; the cost of a packet of cigarettes; the places where smokers purchased their cigarettes; the percentage of smokers who started smoking regularly before they were aged 15 and; their exposure to second hand smoke at work.

Similarities in policies for tobacco control included picture health warnings on packaging and security features to limit sales of counterfeit or smuggled products as the most popular. Overall the countries with the greatest percentages of respondents in favour of the listed policies were the UK (68.4%) and Hungary (67.7%) compared to the Netherlands (51.8%). Progress on implementation of the WHO FCTC varied with UK as the first and Germany as 33rd out of the 34 European countries included on the Tobacco Control Scale in 2013.

This review therefore showed that successful transferability of economic evidence from a one country to another depends on, amongst other things, how well the variation in contextual parameters from the original setting to evidence-recipient countries is understood. The 5Ps contextual visualisation, presented in this analysis, could serve as a useful screening tool to this end.

Sub-study 2: Understanding stakeholder views on the ROI Tools

This sub-study was a cross-sectional mixed method study, in which qualitative and quantitative research techniques were combined, was conducted among stakeholders from the five European countries (Germany, Hungary, Spain, the Netherlands and the United Kingdom). This sub-study was conducted between April and July 2014 is described in full elsewhere (20-21) but a summary is provided below. The questionnaire used in the stakeholder interviews was developed by EQUIPT project partners through an intensive deliberation and partly based on the Integrated-Change (I-Change) Model and other relevant constructs related to the adoption of innovations (18, 26). Open-ended questions as well as single choice and Likert-scale questions were asked where appropriate. We asked 93 stakeholders (from a list of 167 stakeholders approached, 56.9% response rate) from five countries (Germany, Hungary, the Netherlands, Spain and the UK) a number of questions related to the ROI Tool. Of the 93 respondents, 30.1% were Dutch, 17.2% Hungarian, 18.3% German, 19.4% Spanish, and 15.1% British. Respondents were from different categories of stakeholders: decision-makers (31.2%), purchasers of services/pharmacological products (7.5%), professional service providers (19.4%), evidence generators (26.9%), and advocates of health promotion (15.1%) (20-21). A follow-up survey was conducted between October 2015 and July 2016, including a heuristic evaluation, a thinking-aloud
approach, and a questionnaire testing to explore the usability of the ROI model (27).

This sub-study was able to answer the following 4 questions:

Analysis 2.1: Do all stakeholders view the ROI concepts, tools and evidence in the same way?

The survey data corresponding to the priority and needs assessment, the awareness of stakeholders about the principles of health economic analysis, and potential usage of the ROI tool were analysed by country and stakeholder categories. This analysis in full has been published elsewhere (21); a summary of findings is provided below.

The majority of the stakeholders were familiar of basic principles such as incremental cost, cost-effectiveness and perspectives of health economic analysis, who were also aware that a cheap intervention is not necessarily cost-effective, and that an intervention with higher societal costs than the regular care can be cost-effective. The respondents were least familiar with ‘willingness to pay’. There was a statistically significant difference between the countries in respondents’ understanding of ‘incremental costs’. Unsurprisingly, evidence generators (i.e. academics/researchers) were the most familiar group in terms of awareness of economic concepts. All stakeholders across the countries strongly agreed that mortality and societal costs of smoking were high and thought that its epidemic was severe. Respondents from the Netherlands, Hungary and Germany were uncertain about effectiveness and cost-effectiveness of the smoking cessation interventions, while the interviewees in Spain and the United Kingdom mostly agreed with the statements that these interventions are effective and cost-effective. Although the level of agreement varied significantly by country, the interviewees’ general opinion was that it was unacceptable that smoking cessation interventions are used without knowing their efficacy and their cost-effectiveness. In general, all the listed health technology assessment (HTA) information, including prevalence of smoking, cost of smoking, quality of life, mortality due to smoking, effectiveness of smoking cessation interventions (such as quit and relapse rate), cost-effectiveness data comparing the cost of smoking cessation interventions with its health and wider benefits and budget impact reflecting financial outcomes specifically at organisational level, was considered very important and the stakeholders wanted the ROI tool to provide all of this information.

Information on the cost-effectiveness of smoking cessation interventions was found to be the most important health technology assessment (HTA) information in most countries (except in Hungary and Germany, where the costs of smoking had the largest mean score). In Hungary, the burden of disease due to smoking measures (prevalence, costs and mortality of smoking, effect on quality of life) had higher mean scores than in any of the other participating countries. Nevertheless, health economic measures were not undervalued in Hungary compared to the other countries. In countries where cost-effectiveness was considered to be the most important of the HTA data to be included, it was followed by the cost of smoking in the United Kingdom, effectiveness of smoking cessation interventions in the Netherlands and budget impact in Spain. The importance of information on costs of smoking and smoking-attributable mortality showed statistically significant variations by country, both receiving the highest score in Hungary and the lowest in Spain, for costs of smoking and in Germany for smoking-attributable mortality. In most stakeholder categories, except for professional service providers, cost-effectiveness was considered to be the most important information.

The vast majority (81%) of the stakeholders proposed other types of evidence in the open-ended questions than those provided by the ROI tools, which they considered important in the decision-making process on the implementation of tobacco control measures and smoking cessation interventions. Their suggestions varied greatly, the most frequent propositions were information about absenteeism, days off work, more details about the smoking cessation interventions (e.g. effectiveness, accessibility), cost, effect of smoking-related diseases on quality of life, indirect costs, more detailed healthcare utilization data, popularity of a smoking cessation programme among smokers, and results of target group analysis. This analysis therefore showed that various types of stakeholders from different countries consider HTA evidence important in their decision-making process. The survey findings served as important input to the development and country adaptation of the ROI tool to ensure that the final product of the EQUIPT project would reflect the needs and expectations of the stakeholders.
Analysis 2.2: What factors predict stakeholders’ intention to use a ROI tool?

Stakeholders’ views on the possible advantages and disadvantages of using the ROI tool, internal and external facilitators, and barriers of the use by intenders and non-intenders were analysed and reported in the framework of the I-Change model [20-21]. A summary of the findings are presented below:

Stakeholders from all sample countries expressed their intention to use a ROI tool; the intended level being highest amongst the Hungarian stakeholders and lowest amongst the Dutch and German stakeholders. Respondents from Hungary and Spain wanted to use the tool as soon as possible, while in the United Kingdom and Germany they were more likely to introduce it in a year, and the Dutch were uncertain about the timeframe of its utilisation. Whilst the purchasers of services and pharma products said they were most likely to use the tool, and the advocates of health promotion showed the least intention to use the tool (21).

On comparing the intenders and non-intenders in their beliefs, we found no overall difference in their knowledge. However, pre-motivational beliefs in terms of risk perception differed between non-intenders and intenders. Intenders perceived the smoking epidemic as more severe in their country, and perceived greater importance to use smoking cessation interventions due to their impact on reducing mortality and healthcare costs. Motivational beliefs in attitude, social support, and self-efficacy differed between intenders and non-intenders. Compared to non-intenders, intenders expected the ROI tool to provide financial justification, an easy interface, up-to-date information, relevant outcomes for the organisation, sufficient scientific support for decision-making, added value to current information, support in choosing smoking cessation methods, integration of all relevant information, different time horizons, assessment of cost-effectiveness of new interventions, assessment of potential new interventions, and increased efficiency in service delivery. Intenders also expected more social support, i.e. from their boss, other colleagues, organisations, reimbursement agencies, the ministry of health, and health professionals like medical specialists to use the ROI tool. In multivariate analysis, a positive attitude of the ROI tool and the perception of high social support to use the ROI tool were positively associated with the intention. Self-efficacy was not identified as a significant explanatory variable for intention (20).

This analysis therefore showed that pre-motivational and motivational factors (i.e. awareness, attitude, and social support) explain a significant proportion of variation in stakeholders’ intention to take up an economic decision-support tool. Future communication strategies to promote the use of economic decision-support tools among stakeholders should therefore focus on those factors, for example, by highlighting the advantages of such tools for decision-making. The survey findings served as important input to the development of the EQUIPT ROI Tool and dissemination materials.

Analysis 2.3: What (tobacco cessation) intervention is important to include in the ROI tool?

Stakeholders’ responses about the availability and the importance of the smoking cessation interventions across the sample countries were analysed and full results are reported elsewhere (28). As the extent to which stakeholders in different European countries were aware of the availability of tobacco-control interventions and agree on their relative importance was largely unknown, this analysis assessed views of stakeholders and compared the perceived ranking of interventions with evidence-based ranking using cost-effectiveness data.

Stakeholders from Germany, Hungary, the Netherlands, Spain and the United Kingdom were asked to rate availability and importance of 30 tobacco-control and smoking cessation interventions in their country. A mean importance score across the whole sample for each intervention was calculated and used to rank the interventions. This ranking was compared with a ranking based on cost-effectiveness data derived from a review study (29). The Kendall rank (tau) correlation coefficient was used to assess agreement levels.

Across 93 stakeholders (55.7% response rate), there was very low agreement on availability of the interventions (Kappa =
and moderate agreement on their importance (Kappa = 0.385; 95% CI = [0.333 0.471]). A ranking of importance was not statistically concordant with established cost-effectiveness (Kendall rank correlation coefficient = 0.40; p-value = 0.11; 95% CI = [-0.09 0.89]).

This analysis therefore showed that European stakeholders demonstrated low agreement on the availability but moderate agreement on the importance of tobacco-control interventions. These intrinsic differences in stakeholder views must be addressed while transferring economic evidence Europe-wide. If stakeholders agree on the importance but differ on availability, it is the latter that may need to be addressed. This is because if, for example, a commissioner or decision maker doesn't know something is available, it will not be included in the alternate package of interventions.

Strong engagement with key stakeholders, focussing on better communication, has a potential to mitigate this challenge, and save scarce resources. These recommendations fed in to the later tasks within the EQUIPT study, in particular they facilitated the study team’s decision as to what interventions were important to include in the EQUIPT ROI tool.

Analysis 2.4: What determines the usability of a ROI Tool?

The follow-up survey conducted after the adaptation of the NICE ROI tool, which led to the first version of the EQUIPT ROI Tool, has been described elsewhere (27). Economic decision-support tools can provide valuable information for tobacco control stakeholders, but their usability may impact the adoption of such tools. The perception of a tool's usability may impact motivational factors and hence the ultimate impact that such a tool may provide on improving population health. This analysis therefore aimed to explore the effect of usability on motivational factors and the intention to use an economic decision-support tool for tobacco control.

A total of 66 stakeholders evaluated the adapted tool by using a thinking aloud procedure and completing a questionnaire. For the heuristic evaluation, four experts evaluated the interface. In total 21% of respondents perceived that the tool had good usability features. A total of 118 usability problems were identified, from which 26 problems were categorised as most severe indicating high priority to fix them. Multiple regression analysis following an I-Change construct showed that the usability of the tool and attitudes of stakeholders to use such a tool was positively correlated.

This evaluation therefore provided input to aid optimisation of the usability of the EQUIPT ROI tool while it was being developed for use in several EU member states.
were used. The criteria essentially allowed us to score a study on its quality and hence its transferability to other contexts. Studies that were not in smoking cessation, not original research, not a model-based economic evaluation, that did not consider an adult population and were not from a high income country were excluded from the analysis.

Among the 64 economic evaluations included in the review, a state-transition Markov model was the most frequently used method (n=30/64) with Quality Adjusted Life Years (QALYs) being the most frequently used outcome measure in a lifetime horizon. A small number of the included studies (13/64) were eligible based on the EURONHEED transferability checklist. The overall transferability scores ranged from 0.50 to 0.97 with an average score of 0.75. The average score per section was 0.69 (range 0.35-0.92). Relative transferability of the studies could not be established due to a limitation present in the EURONHEED method.

This systematic review showed that all existing economic evaluations in smoking cessation lack one or more key study attribute for them to be fully transferable to a new context. The review also highlighted the use of model-based analyses to examine transferability of the economic model, which was taken on by the EQUIPT study team as reported below.

Analysis 3.2: Which variables have most impact on the ROI results?

The economic model underpinning the NICE ROI tool involved a very large number of input parameters, most of which would not have been available in several EU member states where the tool was being adapted to. To inform the focus of future research in the adaptation of a UK tobacco return on investment (ROI) model to other European jurisdictions, a parameter importance analysis (32) was conducted. Using the existing UK ROI model, through Monte Carlo simulation, we created a set of values for all input parameters and outcome in terms of the net benefit of a tobacco intervention package compared to no interventions. Using the dominance measure, we then ranked each input parameter with respect to their impact on output uncertainty. Sensitivity analysis addressed the impact of results to alternate degrees of uncertainty within input parameters and to the willingness to pay (WTP) for a QALY. Full details of this analysis are reported elsewhere (33).

The analysis found that the following are the most influential parameters: the background quit rate, the intervention uptake rate, and the relapse rate. The cost of interventions with productivity losses due to smoking, utility associated with smoking status, the relative risk of stroke and coronary heart disease (CHD) and the cost of smoking attributable diseases were of less importance. All other parameters were of negligible importance. Results were robust to alternate assumptions regarding willingness to pay (WTP) threshold and to the degree of uncertainty surrounding each of the parameters.

This analysis therefore identified those parameters which contributed greatest to output uncertainty. This knowledge facilitated the adaptation of the existing model to further jurisdictions.

Analysis 3.3: What is the minimum number of input variables that must be collected from a local context to make the EQUIPT ROI Tool transferable to that context?

This analysis was conducted to inform transferability of economic evidence to resource-poor countries (in particular, Central and Eastern European nations). This was achieved by identifying key input parameters that can cause significant variation in the return-on-investment (ROI) measures across different jurisdictions in the EQUIPT (European-study on Quantifying Utility of Investment in Protection from Tobacco) model. Full details of this analysis are reported elsewhere (34).

Following a Markov state transition framework, the EQUIPT model was set up to predict the ROI measures for tobacco control interventions in five European countries (UK, Spain, Germany, the Netherlands and Hungary) and is therefore (input) data-hungry. To be able to assess the extent to which the model would require country-specific data if it were to be transferred to Central and Eastern Europe (CEE), a one-way sensitivity analysis was conducted on all the input parameters collected from the five countries. Base case results were obtained through average values of all input parameters, which were then replaced one
at a time with country-specific values. The resulting outcomes (i.e. changes in ROI measures) were evaluated thoroughly using tornado diagrams. Finally, a short list of input parameters was constructed to guide additional data collection from CEE to further evaluate the transferability of the EQUIPT model.

A total of 16 sets (out of 49 sets) of input parameters were identified to have caused significant variation in model outputs. Fourteen of these input parameters caused variation that was considered large (>10%) in at least six of the eight ROI measures. This information facilitated the construction of a short list of ‘transferability parameters’ that included key parameters such as smoking prevalence, costs of smoking-related diseases, discount rates and a few general attributes of the population.

This analysis therefore led to a short list of key parameters which provides countries that have limited time and other resources to conduct research with an opportunity to adapt the EQUIPT Tobacco ROI model to their own settings. These countries can choose to collect local values only for the key parameters and after applying those in the EQUIPT model, they will be able to generate results relevant to their own countries.

Sub-study 4: Implementing the adaptation of the NICE ROI Tool to other European contexts

This sub-study examined implementation of the adaptation process when the NICE ROI tool was being transferred to the EQUIPT ROI tool. This included defining the selected interventions; estimating the effectiveness, reach (uptake) and costs of the included interventions; and re-modelling the underlying economic framework for all five countries.

Analysis 4.1: How are interventions (included in the ROI tool) defined; how are their effect size and reach estimated?

Modelling likely return on investment from smoking cessation interventions requires estimates of effectiveness and reach of the interventions. Such estimates can be arrived at in a number of ways, each with strengths and limitations. Full details of this analysis are described elsewhere (35).

Estimates were derived for population-wide and clinical interventions aimed at promoting quit attempts and improving the success of quit attempts, including pharmacotherapies, behavioural support, social marketing campaigns, and smoke-free legislation. The sources used were systematic reviews of effectiveness combined with survey data from England using the Smoking Toolkit Study, the most detailed survey of smoking cessation in Europe. The resulting estimates form a starting point for adjustment according to different national contexts.

Quit attempt rates were estimated to be increased by the following ratios for those reached, with percentage of smokers reached in brackets (reach values are for England, as exemplar): 1) 20% by tax increases raising the cost of smoking 5% above the retail price index (100% reach), 2) 10% by enforced comprehensive indoor public smoking bans (100% reach), 3) 40% by brief opportunistic physician advice (21% reach), 4) 110% by use of a licensed nicotine product to reduce cigarette consumption (12% reach), 5) 3% by social marketing campaigns achieving 400 gross rating points (100% reach). Quit success rates were estimated to be increased by the following ratios: 6) 60% by prescribed single form licensed nicotine products, and bupropion (5% and 1% reach respectively), 7) 114% by prescribed dual form (transdermal patch plus a faster acting product) nicotine products (2% reach), 8) 130% by prescribed Varenicline (5% reach), 9) 100% by prescribed Nortriptyline (0% reach), 10) 230% by prescribed Cytisine (0% reach), 11) 40% by individual face to face behavioural support and telephone support (2% and 0.5% reach respectively), 12) 100% by group behavioural support (1% reach), 71% by SMS text messaging (0.5% reach), 13) 19% by printed self-help materials (1% reach). There was insufficient evidence to obtain reliable estimates for interventions such as websites, smartphone apps and e-cigarettes.

This analysis showed that a wide range of population-wide and clinical interventions have demonstrated effectiveness in promoting smoking cessation. Clinical interventions tend to have greater effectiveness but lower reach. These estimates were
later included in the EQUIPT ROI tool.

Analysis 4.2: How are costs of interventions and costs of treating smoking-attributable conditions/consequences sourced/estimated?

Modelling likely return on investment from smoking cessation interventions also requires estimates of costs of the interventions as well as costs of smoking attributable diseases. Full details of this analysis are described elsewhere (36).

Mean cost estimates for each participating country were derived for four type of resource use: (a) treatment of smoking-related diseases (coronary heart disease; chronic obstructive pulmonary disease; lung cancer and stroke); (b) implementation of the interventions (pharmacological and behavioral interventions); (c) treating diseases attributable to passive smoking (for children and adults); and (d) productivity losses (days lost per smoker). Best estimates of those costs for each country were sourced from systematic reviews combined with national databases. National formulary data were combined with intervention definitions to cost pharmacotherapies. Costs differences across countries were evaluated using the annual exchange (Eurostat data) of the last available year (e.g. 2015). All costs were expressed in €2016.

Smoking-related disease costs varied across countries. For example, annual cost of lung cancer treatment in the UK was €8 574 whilst in Germany it was €46 630. All countries used healthcare perspective to source this data with the exception of Spain where hospital-based costs were included due to limitations in the availability of data. Hungary and United Kingdom were the only countries where national average cost for each behavioural intervention included in the model was available. Costs of pharmacotherapies were comparable, as all countries used the same method to estimate the costs based on respective national formulary data. Passive smoking related costs across countries varied widely because of country-level differences in treatment costs. Significant variation across the countries was also observed in productivity related parameter values.

This analysis highlighted the need for a European Costs Data Registry to collect costs data using harmonised methods and definitions. Such a registry will facilitate robust estimation of those costs by reducing uncertainties around currently available costs data and will allow studies like EQUIPT to provide more robust cost-effectiveness estimates.

Analysis 4.3: How is the economic model underlying the EQUIPT ROI implemented?

The EQUIPT project has been funded to adapt an existing ROI tool for England to four core European countries (Germany, the Netherlands, Spain and Hungary). The objective of this analysis was to devise methods for EQUIPTMOD, the economic model at the core of the ROI tool and to identify the key outcomes associated with both continued and cessation of smoking. Full details are reported elsewhere (19, 37).

EQUIPTMOD is designed to facilitate the determination of an optimal package of smoking cessation interventions. EQUIPTMOD uses a Markov state transition cohort model to estimate the lifetime costs, quality adjusted life years (QALYs) and life years associated with a current smoker and former smoker. It utilises population data on smoking prevalence, disease prevalence, mortality and the impact of smoking combined with the associated costs and utility effects of disease. To illustrate the potential for the ROI tool, costs, QALYs and life expectancy were estimated for the average current smoker in England based on the assumption that they continue smoking over the next 12 months but a proportion of those will cease smoking. All outcomes were discounted at a rate of 3% per annum.

Over a lifetime horizon, the ROI model predicted that continuing smoking result in higher disease related healthcare costs (€6 148 in England, for instance) than if the smoker ceased smoking in the next 12 months. For each age-sex category, costs were lower and QALYs higher for those who quit smoking in the first twelve months than those who did not. As has been observed elsewhere, lifetime QALYs tended to be higher for females than males. However, QALYs for males who quit smoking were
higher than for females who did not quit smoking.

This analysis therefore showed that EQUIPTMOD could facilitate the assessment of the cost effectiveness of alternative strategies as developed within the EQUIPT ROI tool. The demonstrated results indicate the large potential benefits from smoking cessation both at an individual and population level.

Sub-study 5: Understanding the results from the ROI Tool

The EQUIPT ROI tool offers untapped opportunities to simulate various investment scenarios related to tobacco cessation in sample countries. The Zero Investment Scenario presents the theoretical gross cost of tobacco to society if all ongoing financial investment in interventions and policies were immediately cut (note: some policies would continue to be effective without continued investment). The Zero Investment scenario thus provides a benchmark against which to compare the impact of your selected package of interventions. The Current Investment Scenario represents the estimated amount of money that is actively being spent on tobacco control interventions in a country this year. The Prospective Investment Scenario represents the potential future level of funding required to deliver interventions when user-defined changes are made to the Current Package. This new collection of interventions is referred to as the “Prospective Package” and this scenario allows one to determine the potential ROI of making amendments to the current provision of services.

This sub-study used the EQUIPT ROI tool to answer the following three questions:

Analysis 5.1: How cost effective is the current provision of tobacco cessation in sample countries?

The EQUIPT ROI tool was used to understand the health and economic returns from the current provision of tobacco cessation interventions in the five sample countries - Germany, Hungary, the Netherlands, Spain and England. Current provision was defined as the mix of interventions that are currently being offered and used in a country and thus represented the estimated amount of money that is actively being spent on tobacco control interventions in that country this year. The tool was run for various time horizons, and took healthcare and wider perspectives. As required input data was not available for some countries, the analysis for those countries was conditional on using the best available evidence from another country. Full details are reported elsewhere (24).

This analysis showed that government actions, including maintaining a national network of stop-smoking services and adequately funding mass media campaigns, could save €829m this year across 5 EU countries. Savings come from reduction in costs of treating four diseases caused by smoking – lung cancer, coronary heart disease, chronic obstructive pulmonary disease and stroke (€475m) - and productivity gains (€322m) resulting from 3m fewer days of smoking-related absenteeism. An additional €32m of savings come from reductions in healthcare costs because of fewer non-smokers inhaling other people’s smoke. Every € spent in the current provision would provide a return between €3 and €9 over lifetime, depending on the country and what willingness-to-pay threshold for a QALY gain was used.

The analysis therefore showed that existing services as a package to promote tobacco cessation in countries are cost-effective and decisions to disinvest from those services altogether are not financially justified.

Analysis 5.2: Is a change in the current provision of tobacco cessation more cost-effective?

In this exemplar analysis, the potential return on investment (ROI) of making amendments to the current provision of services was determined. This was done by first estimating the potential future level of funding required to scale up GP brief advice. Full details are provided elsewhere (24).
In England, for example, improving the reach of the GP brief advice from the currently observed level of 21% to a target level of 25% would require an increase of €12.1 million. The model predicted that this increased investment will push the overall rate of quit attempts up to 34.95%, resulting in additional 19,705 smokers making quit attempts of which there would be 2,341 successful quitters after 12 months. This would translate to annual savings of about €6.1 million, of which €3.8 million would come from reductions in smoking-attributable healthcare costs, €223,693 from reductions in healthcare costs due to second hand smoke, and €2.1 million from productivity savings. For each € spent to scale up GP brief advice at that level, the financial return would range from €0.48 (2 years) to €6.91 (lifetime) if both healthcare costs and value of health gains (@ €27,554 per QALY) were considered.

Analyses on other countries showed similar pattern in the estimated return on investment if the GP brief advice were scaled up over and above the current level. Amongst the five countries included in the EQUIPT study, Germany had the lowest uptake of GP brief advice currently (1.58%). Scaling up to a target level of 5% would require additional funding of €8.9 million. This would generate 4,352 additional successful quitters after 12 months, translating to a total annual savings of €23.1 million. The benefit-cost ratio ranged from 2.1 (2 years) to 37.1 (lifetime) if both healthcare costs and the value of the health gains (@ €40,000 per QALY assumed as there is no threshold in Germany) were accounted for.

This analysis therefore showed that countries could set targets to improve the current reach of existing interventions that could offer positive return on investment. The EQUIPT economic model can be a useful tool to simulate ROIs from various prospective investment scenarios such as the ones presented in this analysis.

Analysis 5.3: To what extent tobacco cessation interventions are cost-effective in a given country?

The EQUIPT ROI tool can be used to understand the health and economic impact from investing in tobacco cessation interventions in any sample country included in the tool. A series of analyses were conducted to provide examples of country applications of the tool.

Smoking remains a major public threat in Germany, as the mortality rate of lung cancer for females is steadily rising and smoking is the biggest risk factor for lung cancer. Smoking prevention and cessation are key leverage points to prevent the negative consequences of smoking in Germany. Evaluating the cost effectiveness of respective interventions is necessary to foster their practical implementation. Full details of this analysis are reported elsewhere (38). In this analysis, the EQUIPT ROI tool was run to evaluate the effects of increased uptake rates for three interventions - group-based behavioural support, financial incentives and Varenicline - for smoking cessation in Germany over a lifetime horizon. The deterministic results showed that those interventions were cost saving. The highest returns were seen for the financial incentive program (€2.71/EUR invested), followed by group-based behavioural support (€1.63/EUR invested). Varenicline had the lowest returns (€1.02/EUR invested) but was still dominant. A moderate uptake increase of 1% point for all three interventions lead to 15,034 QALYs gained and to incremental savings of €27,133,798. Intervention effects and uptakes contribute most to the uncertainty of the return-on-investment metrics - both around the mean aggregated costs and QALYs. This analysis therefore showed that increasing the uptake of group-based behavioural support, financial incentive programs and Varenicline for smoking cessation could be a useful and cost-effective healthcare policy to address the scourge of tobacco, and eventually, to improve public health outcomes in Germany. However, regulations that are specific to Germany should be taken into account to enable the implementation of such a policy.

Another example analysis was conducted to evaluate the ROI from investing in GP brief advice to support current smokers stop smoking in the Region of Murcia in Spain [see (39) for full details]. This analysis was performed from the perspective of the National Health System. The incremental cost-effectiveness ratio (ICER) was €172,400 per QALY in the short term (5 years); €30,300 per QALY gained in the medium term (10 years); and €7,260 per QALY gained in the maximum time horizon (20 years) considered by the model. The analysis therefore showed that brief advice intervention was more efficient in the long term than in the short term and, depending on the Spanish cost-utility threshold, policies to publicly fund this
The third example analysis was conducted in Hungary where tobacco smoking constitutes a major societal burden. The prevalence of smoking is 36% among males and 26% among females (40). The total number of deaths related to smoking was 20,470 in 2010 (41). The aim of this analysis was to use the EQUIPT ROI tool to evaluate the effects of implementing smoking cessation interventions. Two intervention scenarios were assessed: (i) introducing a social marketing campaign; and (ii) doubling the uptake of group-based behavioural support therapies and pro-active telephone support. Both scenarios were proven to be cost-saving compared to the current investment package as they provided more QALYs for the smokers for less costs (taking into account the resources spent on treating smoking-related diseases and all other relevant costs) on a lifetime-long time horizon. The first scenario increased the number of quitters per 1 000 smokers from 10.33 to 10.63 while the second scenario increased the number of quitters per 1 000 smokers to 10.41. The analysis therefore showed that both scenarios are cost-effective. This analysis also demonstrated that the EQUIPT Tobacco ROI tool can support decision making on smoking cessation interventions in Hungary. Full details of this analysis are presented elsewhere (42).

The fourth analysis was conducted in the Netherlands. Increasing evidence suggest that internet-based smoking cessation interventions may be effective in smoking cessation (43). Yet, it is not clear to what extent these interventions are cost-effective in the Netherlands. This analysis aimed at evaluating the cost-effectiveness of adding internet-based interventions to the current tobacco cessation provision in the Netherlands. Full details are reported elsewhere (43). Before running the EQUIPT ROI tool, a literature search was conducted to identify potential type(s) of internet-based smoking cessation interventions relevant to the Netherlands. A meta-analysis was then performed to estimate the pooled effectiveness of all relevant interventions to create a prototype intervention that could be included in the ROI tool. This prototype intervention was then evaluated using the EQUIPT ROI tool. Deterministic sensitivity analyses were conducted to address the uncertainty due to intervention costs per smoker, relative risks, and the uptake values. The analysis showed that adding an internet-based intervention to the current tobacco cessation practice was cost-saving (i.e. was less costly to run and produced more QALYs) for all time horizons (i.e. 2, 5, 10 years and lifetime) considered in the study compared to current provision. This analysis therefore provides policy makers with a financial argument to implement and promote internet-based smoking cessation interventions in the Netherlands.

Sub-study 6: Understanding the implications of the EQUIPT study

This sub-study used the stakeholder workshop method, coupled with pre- and post-event surveys, to understand the implications of the ROI Tool, including its current use in England and potential use in several EU member states and CEE countries. The workshop organised in London (March 3, 2016) explored English stakeholders’ views on the use of the NICE ROI Tool in policy/decision making whilst the workshop organised in Zagreb (June 3, 2016) explored CEE stakeholders’ views on the transferability of EQUIPT tool beyond the sample countries.

This sub-study answered the following three questions:

Analysis 6.1: What are the UK stakeholders’ views on the usage of the NICE ROI tool?

The aim of this analysis was to explore decision makers’ and wider stakeholders’ views about the use of the NICE Tobacco Return on Investment (ROI) tool in policy making. This study is reported elsewhere (23). The NICE ROI Tool was published in 2012 and anecdotal evidence at the time suggested that the tool was being used in making business cases, writing reports and informing evidence review. However, no systematic enquiry was available to suggest how local, context-specific, robust evidence in the form of NICE ROI tool translated into action (i.e. policy making).

In a half-day workshop organised in London, a group of decision makers and wider stakeholders were asked to state their experience of using the NICE Tobacco ROI Tool since its inception. A pre-workshop survey was conducted to understand what
people had used the tool for, what they had liked and disliked about it and the facilitators and barriers to usage. The summarised results of the pre-survey, presented at the beginning of the workshop, led to more elaborate but structured discussions with all respondents around the pathway from tobacco evidence into (local) action. A post-workshop survey confirmed stakeholders' views on how the ROI tool could improve translation of evidence into action.

The majority of participants (60%) had used the ROI tool for input to policy proposals. The tool had also been used for writing reports (40%) and business cases (30%). Participants liked granularity and the up-to-date data though 50% found it complex and time-consuming to use. The tool had been a facilitator for informing spending reviews (60%); participants noted such tools could inform disinvestment as well as investment decisions relating to stop smoking services. Qualitative feedback provided better explanation as to why/how that could be achieved.

This analysis therefore confirmed that locally relevant evidence has a potential to feed into policy-making. A decision support tool co-created with stakeholders can facilitate the translation of evidence into action. These findings fed into the development of the European ROI model (EQUIPT).

Analysis 6.2: How do Central and Eastern European (CEE) stakeholders see the value of the ROI Tool?

The aim of this analysis was to evaluate the transferability of policy proposals and their evidence base across Central and Eastern European (CEE) countries for the implementation of public health policies and to support the validation of the EQUIPT Tobacco ROI model in lower-income European countries. Full details of this analysis are reported elsewhere (23).

In Zagreb, Croatia, a one-day International workshop was held on 3rd of June 2016. The twenty invited stakeholders were representatives of five different groups (policy makers, payers, patient representatives, healthcare providers, public health experts and HTA agencies) and came from eleven CEE countries (Bosnia and Herzegovina, Croatia, Czech Republic, Greece, Latvia, Montenegro, Poland, Serbia, Slovakia, Slovenia and Ukraine). They filled out a pre-meeting survey on evidence use and tobacco control before they were familiarized with the model during the workshop. After a roundtable discussion, a post-meeting survey on the usability of the EQUIPT Tobacco ROI Tool was filled out.

Findings from the pre-meeting survey showed that stakeholders considered quit-rates as well as relapse-rates being the most important outcomes that could justify investment decisions. Most of the responders (88%) viewed that budget constraint was the highest barrier to the adaptation of the tool. The post-meeting survey showed consensus among all participants that: (a) the EQUIPT Tobacco ROI Tool is able to support country-level policy decisions; (b) that the EQUIPT study makes it feasible to limit local data collection to the most relevant input parameters; and (c) the rest of the influential factors can be gathered from international sources.

This workshop therefore allowed the stakeholders to learn more about the EQUIPT ROI tool and its application through group work and discussions. The pre- and post-meeting surveys allowed researchers to quantify the value of EQUIPT tool from transferability perspective. Setting up an international stakeholder advisory panel to support transferring the evidence base and EQUIPT model in CEE countries was recommended.

Summary of main S&T findings/foregrounds:

- Transferability of economic evidence from a one country to another depends on, amongst other things, how well the variation in contextual parameters from the original setting to evidence-recipient countries is understood.
- Various types of stakeholders from different countries consider health technology assessment (HTA) evidence important in their decision-making process.
- Pre-motivational and motivational factors (i.e. awareness, attitude, and social support) explain a significant proportion of variation in stakeholders' intention to take up an economic decision-support tool.
• European stakeholders demonstrate low agreement on the availability but moderate agreement on the importance of tobacco-control interventions. These intrinsic differences in stakeholder views must be addressed while transferring economic evidence Europe-wide.

• All existing economic evaluations in smoking cessation lack one or more key study attribute for them to be fully transferable to a new context.

• Countries can choose to collect local values only for 16 sets of key parameters (out of 49 sets) included in the EQUIPT ROI tool to be able to generate results relevant to their own countries.

• A wide range of population-wide and clinical interventions have demonstrated effectiveness in promoting smoking cessation. Clinical interventions tend to have greater effectiveness but lower reach.

• Continuing smoking result in higher disease related healthcare costs (€6 148 in England, for instance) than if the smoker ceased smoking in the next 12 months.

• Government actions, including maintaining a national network of stop-smoking services and adequately funding mass media campaigns, could save €829m this year across 5 EU countries.

• Savings come from reduction in costs of treating four diseases caused by smoking – lung cancer, coronary heart disease, chronic obstructive pulmonary disease and stroke (€475m) - and productivity gains (€322m) resulting from 3m fewer days of smoking-related absenteeism. An additional €32m of savings come from reductions in healthcare costs because of fewer non-smokers inhaling other people’s smoke.

• Every € spent in the current provision would provide a return between €3 and €9 over lifetime, depending on the country and what willingness-to-pay threshold for a QALY gain was used.

• Existing services as a package to promote tobacco cessation in countries are cost-effective and decisions to disinvest from those services altogether are not financially justified.

• Countries could set targets to improve the current reach of existing interventions that could offer positive return on investment. Scaling of GP brief advice, for example, would provide positive return on investment, even in the short term.

• Increasing the uptake of group-based behavioural support, financial incentive programs and Varenicline for smoking cessation could be a useful healthcare policy to address the scourge of tobacco, and eventually, to improve public health outcomes in Germany.

• Introducing a social marketing campaign in Hungary is cost-effective. So is doubling the uptake of group-based behavioural support therapies and pro-active telephone support.

• Adding an internet-based intervention to the current tobacco cessation practice is cost-saving (i.e. is less costly to run and would produce more QALYs) in the Netherlands.

• Locally relevant evidence has a potential to feed into policy-making. A decision support tool co-created with stakeholders (e.g. EQUIPT ROI tool) can facilitate the translation of evidence into action.

References


25. Jones T. on behalf of the EQUIPT Study Group. Contextual visualisation to understand cross-context variation in transferring economic evidence (completed manuscript).


Comparative effectiveness research (CER) in existing healthcare interventions, particularly around non-communicable diseases, is not new (7-8). Countries where the use of health technology assessment (HTA) is a common practice (e.g. England) national guidelines already exist but are updated at regular intervals and/or actual funding decisions are underpinned by HTA-type analysis including the ROI analyses (8). However, there are many EU member states where such information has not been accessible, undermining their ability to develop such guidelines or make funding decisions explicit on costs and effects of healthcare interventions. EQUIPT has raised this awareness. It has also supported stakeholders across Europe and beyond in thinking about developing their own national guidelines on tobacco cessation. EQUIPT has raised
awareness among stakeholders of the potential use of EQUIPT ROI tool in supporting decisions where more cost-effective interventions need to be implemented and where less cost-effective interventions should be stopped. The data collected post-meetings in all stakeholder engagement events consistently showed this impact (23).

EQUIPT consortium began to develop in 2010 with a small scale study in England and two years later developed the first ever ROI tool for National Institute for Health and Care Excellence (NICE) to aid local decision making in England (12) and won the prestigious FP7 grant to roll it out to Europe (11). In just six years, the consortium has achieved such an ambitious goal, thanks to the strong partnership we have developed with our valued stakeholders. The formation of the International Stakeholder Panel on EQUIPT (http://equipt.eu/panel) which draws from the experience and expertise of various key players in the public health and tobacco control field, as the result of the FP7 project is a significant development in producing the impact of EQUIPT eventually. The guidance and support received from this partnership has already made an impact in terms of raising awareness of the EQUIPT ROI tool in CEE countries.

EQUIPT has delivered a fully validated, robust, transferable decision support tool to conduct ROI analyses of healthcare interventions on tobacco cessation. By including 17 effective and safe interventions at individual and population levels and explicitly considering compliance with healthcare interventions in adult populations (via ‘uptake’ of tobacco cessation services) under a health technology assessment methodology, EQUIPT tool and findings are expected to support the development of national guidelines, leading eventually to improved patient and societal outcomes.

We have received overwhelming support from potential end-users (stakeholders) to utilise the EQUIPT tool both in England (where it was pioneered) as well as CEE countries (where there is scarcity of HTA-type information and capacity to guide rational funding decisions) (23). EQUIPT therefore has potential to strongly support the FCTC/MPOWER agenda and the EU Tobacco Control Directives (1). By allowing a linked study funded by the Medical Research Council (UK) to examine the role of stakeholder engagement in EQUIPT, the study offers a rare opportunity to make its own impact explicit by the next year (44).

In the long term, EQUIPT findings will aid funding decisions and will improve the utility and transparency of those decisions. The EQUIPT ROI tool will play a key role to that, as the project has already seen a large number of stakeholders interested in using the tool. This is expected further to improve investment in effective and cost-effective behavioural interventions (i.e. tobacco control and cessation services), in turn generating improvements in quality of life at the population level, coupled with reductions in the major chronic diseases. The resulting cost-saving across the EU has the potential to be enormous. The tool provides estimates of such cost-savings in real time, which can be used for making business cases for tobacco control. The use of this research is not limited to providers and funders of smoking cessation services. This could equally be used by pharmaceutical companies who make quit-support therapies to support their marketing strategies or by insurance companies, who could use it to simulate their reimbursement policies. Additionally, the wider audience (including advocacy groups and businesses) could use the tool to make their cases to support tobacco control. Using the relevant stakeholder engagement and with the help of their own networking, we will continue to facilitate this process proactively. The lessons learnt from this project and the underlying methodologies are potentially applicable to other areas of public health and behavioural change such as obesity, alcohol and physical activity, and this project could lead to similar work in these other important areas. By providing transparent and transferable decision-support tool on tobacco control funding decisions, EQUIPT will help achieve goals of a number of European priorities/policies/strategies, e.g. the EU Health Strategy and the implementation of Europe 2020 of which promoting good health and contributing to addressing the societal challenges of rising levels of chronic disease are integral part. EQUIPT is also aligned with the EU Health Strategy’s key values of evidence-based policy making. Equally, by providing a model that focuses on reducing the harm caused by tobacco and which can be implemented across the EU, it can contribute to efforts to reduce health inequalities between and within Member States. It also supports a key pillar of the EU health strategy “to foster good health in ageing Europe” by helping to provide a valuable resource for tackling tobacco-related lifestyle factors.

EQUIPT has received the ENSP Award for Outstanding European Health Research (7 April 2016). This award is given by the
European Network for Smoking and Tobacco Prevention (ENSP) to projects which have shown an extraordinary degree of dedication to promoting tobacco control activities on the basis of sound scientific evidence.

Dissemination activities:

Several dissemination activities were carried out during the project period, including:

- Publications in scientific journals (11, 20-22).
- Presentations at conferences (see the list below)
- Through Stakeholder Workshops held in London, Zagreb and Croatia (23)
- Policy and Media briefs (23)
- Dedicated website (http://equipt.eu/) with news updates

Future dissemination plans include:

- Publication of all EQUIPT deliverables on the website (http://equipt.eu/deliverables)
- Publication in scientific journals (25, 27-28, 30, 33-36)
- Presentations in major conferences and meetings
- Seeking further partnership with ENSP and others to train stakeholders on the EQUIPT Tool
- Seeking further funding to support the EQUIPT initiative (e.g. H2020).

List of presentations in conferences/meetings:

Dedicated Conference:


Conference organised sessions:

Balancing costs and quality in healthcare in Europe: are studies like EQUIPT the answer?, the European Health Economics Association Conference, Hamburg, 13-16 July 2016 (Speakers: Pokhrel S., Coyle D., Kalo Z.)

Public Health Return on Investment (ROI) tools for local decision-making, the European Health Economics Association Conference, Dublin, 13-16 July 2014 (Speakers: Pokhrel S., Morgan A., Owen L.)

Conference individual paper presentations:

Jones T. on behalf of the EQUIPT Study Group. Role of decision-support tools in narrowing the evidence-to-action gap in tobacco control, Warwick 13-14 September 2016


Németh B, Kulchaitanaroaj P., Lester-George A., Huic M., Pokhrel S., Kalo Z. Identifying the Key Parameters of the European-


Cheung K.L. on behalf of the EQUIPT Study Group. Understanding stakeholders’ intention to use an economic model. the EuHEA PhD Conference, September 2014

Anraad, C. on behalf of the EQUIPT Study Group. Are changes in smoking cessation services provide better value for money?. the Public Health Festival, Manchester 2016


López-Nicolás A y Trapero-Bertran M. Impuestos y control del tabaco. III Jornadas de control y tratamiento del tabaquismo en la Región de Murcia (3rd Workshop on the control and treatment of smoking in the Murcia Region). Consejería de Sanidad y Política Social. Cartagena (Government of Murcia Region), Spain. 22 May. 2014.

Exploitation of results:

The analysis based on the feedback received from the European stakeholders (23) shows that the EQUIPT study results (both the tool and findings) offer evidence-based alternative policies for them to consider and implement to address the scourge of tobacco. Several future needs/strategies have been identified:

a. The EQUIPT team should continuously work with the stakeholders to further develop this programme of research. In this context, an International Panel of EQUIPT Stakeholders (http://www.equipt.eu/panel/) has already been established to exploit the findings. This will ensure the EQUIPT study group access to policy questions which could be answered using the tool.

b. For the EQUIPT ROI tool to support decision/policy making in tobacco cessation, it needs updating when new data become available (for sample countries) and further adaptation (for new countries). This will need additional funding support and the Consortium will look into future funding opportunities (e.g. H2020) to pursue this.

c. Wider dissemination will be provided through the dedicated webpage (http://equipt.eu). The Consortium will conduct
additional analyses based on the EQUIPT model and when they become available, summary findings will be made available on
the website. A press release or policy brief (23) may accompany such publications, where appropriate.

d. All completed and future manuscripts based on the tool and the project will be submitted to scientific journals for
publications (2016-17).

e. The Consortium members will continue to present the Project and Findings at relevant conferences and meetings.

f. Future collaboration will be sought with partners outside Europe, e.g. The Asia Pacific Regional Capacity Building for HTA
(http://arch.apec.org/) to develop this programme of research further.

List of Websites:
Main website address: http://equipt.eu
Web address to download deliverables: http://equipt.eu/deliverables
Technical Questions Contact Person: Dr Subhash Pokhrel, Email: Subhash.Pokhrel@brunel.ac.uk
Logistics Contact Person: Mrs Julie Whittaker, Email: Julie.Whittaker@brunel.ac.uk
Tool-related queries should be directed to: admin@equipt.eu

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