



## research article

# Productive interactions without impact? An empirical investigation of researchers' struggle to improve the elderly's oral health

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**Background:** Achieving impact of research is often seen as requiring productive interaction between researchers and stakeholders. Still, interactions are sometimes not 'productive' and lead to no visible impacts.

**Aims and objectives:** This article studies repeated attempts by researchers to involve different stakeholders to facilitate pathways to societal impact. We look in particular at possible explanations for the lack of impacts.

**Methods:** This is a longitudinal case study of an interdisciplinary group of researchers where we acted as participant observers over a period of close to six years. The studied researchers have in various ways targeted the societal challenge of oral healthcare for the elderly.

**Findings:** We see the societal challenge as a 'problem area' where researchers are one of many stakeholder groups, and where the different stakeholders vary in salience, legitimacy and power. A lack of funding for the research led to continuous efforts to involve new stakeholders, envision new forms of impact, and establish a sense of urgency of the societal challenge.

**Discussion and conclusion:** The case highlights different gaps in the problem area that are organisational, social, and institutional. We also find that there are gaps in how the fundamental societal issue is described and prioritised, and in how responsibilities for finding solutions are distributed. This seems to lead researchers away from extensive interaction and towards more traditional forms of impact through randomised controlled trials and technology push initiatives.

**Key words** impact of research • stakeholders • societal challenges

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## Introduction

The process that yields societal impact from research has been studied from many different theoretical and methodological perspectives over half a century. A common finding is that it most often involves a high degree of interaction between researchers

and stakeholders of research (for example, [Spaapen and van Drooge, 2011](#); [Kok and Schuit, 2012](#); [Matt et al, 2017](#); [Muhonen et al, 2019](#)). The policy recommendation seems to be clear: stakeholders can and should be involved in research activities; and funding organisations all over the world emphasise this in many types of research and development (R&D) support, and in assessment exercises such as the British Research Excellence Framework (REF) and the Dutch Standard Evaluation Protocol (SEP).

But why do some interactions fail to become productive, even if the research addresses important societal issues and stakeholders are involved? Is a lack of impact sometimes also associated with intense and diverse interaction, and what does this imply for our understanding and evaluation of it? This article analyses a case where a cross-disciplinary group of researchers from dentistry, pharmacology and medicine carried out many of the recommended activities to make impact happen, yet without achieving the expected outcomes.

As participant observers (see [Seim, forthcoming](#)), we (the authors) followed the research group as they set up collaboration platforms to study and resolve oral health issues among the elderly in Norway, such as dry mouth and poor dental care. Most actors perceived these as important issues, yet the stakeholder interactions saw challenges tied to, for example, cooperation, shared understandings, and ways forward. Close observation over several years gave us access to information and interactions that otherwise were hidden from the public. Our analysis shows that there are different gaps between the researchers and stakeholders, and between different stakeholders, which may constitute a starting point for a better understanding of preconditions for impact beyond interaction mechanisms. There are also underlying political interests and values that provide challenges for impact (see [MacKillop and Sheard, 2019](#)).

More generally, relevant stakeholders for health research are policymakers, healthcare organisations, practitioners/professionals and patient groups, and the societal impact of research is expected to depend on researchers' productive interactions with these and possibly other groups ([Spaapen and van Drooge, 2011](#); [Muhonen et al, 2019](#)). We define societal issues such as oral healthcare among the elderly as a 'problem area', an analytical term to highlight the link between research impact and stakeholder theory. In a problem area, a variety of actors have a stake in the issue at hand, either directly or indirectly, and researchers are one out of many stakeholders rather than the origin of ideas which other relevant actors get involved in for further development. In line with key insights from stakeholder theory ([Mitchell et al, 1997](#); [Reed et al, 2009](#)), we suggest that stakeholders' characteristics and interest in the issue, as well as the relationships between the actors in the problem area, influence whether or not interactions become productive. We link this to the various dimensions of proximities (see [Boschma, 2005](#)), or rather gaps, that exist between the stakeholders in the problem area. Our analysis shows several gaps between researchers and other stakeholders, despite the latter's enthusiasms about the proposed impact, and that the gaps can be tied to challenges concerning legitimacy, urgency and power (see also [Bandola-Gill, 2021](#)).

In the next section, we provide a brief review of the literature to present the background of our work and to develop an analytical framework rooted in perspectives on research impact, stakeholder theory and different forms of 'proximity' or 'gaps' between stakeholders. The following section gives some details about our case and the action research methodology, while the next parts of the article

present results tied to the problem area, stakeholder relations, and evolution of the impact work.

## Productive interactions and stakeholders in problem areas

Early investigations of research-based innovations tied societal impact to mature knowledge bases where scientists and engineers are familiar with stakeholder needs and perspectives, and where stakeholders similarly are aware of relevant research (Kostoff, 1993). Later studies have furthermore indicated that interaction between scientists and stakeholders is particularly important for translating research perspectives and results into texts, objects, or training programmes for the relevant context of use (for example, Matt et al, 2017). This process is long-lasting and highly interactive, where different types of stakeholders shape the translations, and sometimes the research activities themselves.

Indeed, one of the most influential contemporary impact assessment methods argues that because there are no reliable and accepted indicators of societal impact, and because the time to impact is most often many years, evaluators should focus on ‘productive interactions’ between researchers and stakeholders (Spaapen and van Drooge, 2011). These interactions can be direct (personal), indirect (for example through texts and other artefacts) or financial, and they are productive when the research-based knowledge leads stakeholders to act. Based on many case studies, the authors argue that ‘interactions between researchers and stakeholders are near vital to achieve social impact’ (Spaapen and van Drooge, 2011: 213). Focusing on interactions can be particularly useful for research that deals with complicated social and political processes (Molas-Gallart and Tang, 2011). Impact can happen by involving stakeholders in different ‘pathways’ such as epistemological (new research results are tied to specific problems), artefactual (research generates methods, objects and more), and interactional–institutional (knowledge and values become shared) (Miettinen et al, 2015).

The most common starting point for identifying stakeholders is the idea that stakeholders have different characteristics that give them more or less power or higher potential to influence organisational decisions (Mitchell et al, 1997). This framework has been used to analyse universities’ external relations (Jongbloed et al, 2008; Falqueto et al, 2020) and their societal contributions (Benneworth and Jongbloed, 2010; de Jong and Balaban, 2022). Our departure is, however, not from an organisation, but from what we call a ‘problem area’ defined by a societal issue in which numerous and diverse actors have a stake. This provides an alternative starting point for determining relevant stakeholders compared to most studies and assessments of the societal impact of research, where stakeholders are primarily identified based on their relation to the research(ers). For example, Pedrini et al (2018: 1242) identify stakeholders as those ‘that have expectations of the... research’. In the literature on productive interactions, stakeholders are defined as ‘all those involved in achieving social impact’ (Spaapen and van Drooge, 2011: 212). In other words, the starting point has been that stakeholders are identified primarily on the basis that they have a stake in the researchers’ activities.

By starting from a problem area, we instead assume that researchers have a stake in the issue under consideration alongside other stakeholders, and that all of them may take part in defining and redefining the relevant issues (Reed et al, 2009). We believe that this approach is useful for highlighting the detailed and complex interactions that

take place before impact happens, even if it might be less valuable as a starting point for evaluations of research. Based on the theory on stakeholders by [Mitchell et al \(1997\)](#), we moreover assume that some stakeholders are more salient in the problem area than others, meaning that some stakeholders possess particular characteristics that give them a stronger potential for achieving impact in the problem area. Mitchell and colleagues (1997) define that stakeholders' salience refers to their power to influence the issue, the legitimacy of their claims in the issue, and the urgency of their claims. A stakeholder's power encompasses the ability to influence others' decisions and practices, such as by coercive or financial means, but also through normative or symbolic power and resources. Legitimacy refers to how socially and politically accepted stakeholders' claims of influence in the problem area are (see also [MacKillop and Sheard, 2019](#)). Finally, the dynamics of stakeholder interactions within a problem area may be captured by the urgency of the claims made by stakeholders and whether they call for immediate attention ([Mitchell et al, 1997: 967](#)). Seen together, the combination of different attributes may predict the salience of different stakeholders in the problem area. However, as pointed out by [Reed et al \(2009\)](#), salience is not a sufficient predictor of actual influence. Stakeholders may also hold different interests in affecting the problem area. For example, actors may have little interest, but potentially strong influence on an issue. Such stakeholders may determine the context of the problem. Stakeholders with a strong interest, but a weak influence, lack the potential for changing the problem area, unless they engage in alliances with more influential actors ([Reed et al, 2009: 1938](#)). As one of many stakeholders, researchers must therefore not only demonstrate their own potentials for impact, but they must also identify the right stakeholders to interact with, which may be seen as a process where legitimacy and other issues result from a 'symbiotic negotiation' ([Bandola-Gill, 2021](#)).

However, identifying relevant stakeholders is only a first step for productive interactions to happen. Researchers and other stakeholders may have different knowledge bases, perspectives, time frames and so on, which means that productive interaction requires various gaps to be bridged. A good starting point for analysing gaps between researchers and users is [Boschma's \(2005\)](#) five dimensions of proximity. First, there is a cognitive gap to be bridged, because knowledge bases of the various stakeholders in impact processes can be highly tacit and idiosyncratic. Users may need to develop absorptive capacity ([Cohen and Levinthal, 1990](#)) to be able to adopt external knowledge. Second, an organisational gap may need to be bridged, because research and its use happens in distinct organisational settings. [Boschma \(2005\)](#) argues that financial relations that lead to 'strong ties' may be particularly important here, which can be tied to one of the forms of productive interactions discussed by [Spaapen and van Drooge \(2011\)](#). The third gap is social: stakeholders are embedded in different social contexts but may have ties that give rise to trust such as joint experiences, common backgrounds and friendships. Fourth, fundamental differences in codes of conduct, laws and regulations, and in aspects such as norms, values, and culture between different groups, constitute an institutional gap. In research impact, this gap may be considerable because research is a particular institutionally-based practice that differs from its uptake and use. On the other hand, the push towards impact, evidence-based policies and user interaction can be seen as an attempt to bridge this gap. Finally, a geographical gap may need to be bridged if researchers and their relevant stakeholders are physically far apart. Research is often centralised in large universities and institutes in major cities, while its use is likely to be more dispersed.

The underlying argument in this framework is that proximity (possibly excluding geography) should be moderate rather than small. From a stakeholder perspective, linkages do not merely represent a scale from close to remote but are also characterised by legitimacy, power, and urgency (Mitchell et al, 1997). For example, a sense of urgency might be more easily shared in a close social and organisational setting, and impact may be more likely to happen if powerful stakeholders are close to rather than distanced from key activities. We leave these aspects for the empirical case.

## Case and method

The case is a group of researchers who, over a long period of time, have been involved in research on various aspects of the oral health of the elderly. We (the authors) established contact with the group's lead researcher at a workshop aiming to stimulate cross-disciplinary activities at our home university in 2017, and we have followed their efforts since. The research group had worked with patients suffering from Sjögren's syndrome, an autoimmune disease with dry mouth as a primary symptom, and they wanted to address the issue of dry mouth also in other groups like multi-medicated people and the elderly in general. Their ideas concerned not just finding treatments but also new methods for documentation and policy interventions. Creating societal impacts from their research efforts was a vital motivation from the start.

Our involvement in this team has followed an action research approach in the [Argyris \(1993\)](#) tradition, which means that our aim has been twofold. First, we have aimed to play a role in the team's work by using our knowledge of impact and innovation processes to get the actors to reflect upon values and activities. [Argyris \(1993\)](#) frames this as conscious attempts by the action researcher to get people out of 'defensive Model 1' behaviour: a behavioural pattern that often makes it difficult for individuals and groups to address underlying gaps and bottlenecks in what they want to achieve. Second, we wanted our involvement to support a case study of how researchers struggle to find good pathways into use, even when they (and their funders) have strong motivations to do so. The normative starting point for the action research was not that we had identified one type of impact as more effective or desirable, but that we wanted to be a resource for the team of researchers who sought to make an impact.

The main method for data collection has therefore been as 'observant participants', which refers to how researchers may take on a preexisting role in the field – in contrast to the typical participatory observer ([Seim, forthcoming](#)). This has several benefits, including access to 'backstage' (see [Goffman, 1959](#)) field sites that are otherwise hidden from the public, and the tacit knowledge embodied in the given role – in this case as researchers. We have participated in more than 25 meetings to discuss the work and its progress since early 2017, and we have supported five different applications for research funding. The team has organised four full-day workshops, the first oriented at understanding the causes and nature of dry mouth and related problems, and the second on a specific nanoparticle-based potential remedy for it. The last two workshops involved a broad selection of stakeholders: one with mainly societal stakeholders from policy and practice and from different interest groups (patients, the elderly), the other with mainly expert stakeholders and peer researchers. At the first of the workshops, which also involved researchers and practitioners from outside of Norway, we presented our social science approach to impact, including a practical discussion about productive interactions and relevant models of innovation

(Kline and Rosenberg, 1986). Furthermore, the team has had several meetings with practitioners, and we have participated in meetings and data collection at homes for the elderly in Oslo, to understand the challenges from the stakeholder side and to discuss opportunities for various interventions, such as a 'digital dental card' that some team members were working on.

The action-oriented approach also raises several concerns (see also Khanlou and Peter, 2005). First, the 'messiness' of the role (see Seim forthcoming) demands that our moves between the inside and outside gaze of the field must be clarified to those being observed. We have therefore been careful to introduce the two-pronged aim of our participation in both internal and external settings. Second, we have been sensible to the status and positions of the persons we have met as observant participants, and we have been careful not to include data about third persons in our field notes as well as any sensitive personal information.

Our study's participatory and longitudinal designs have given us access to ample information. Both authors have taken separate notes at meetings and other events, and we have met regularly afterwards to compare and discuss analyses and to revise our approach. In addition, we have email correspondence, project proposal drafts and a variety of other documents such as invitations to events and presentations. This combination of data gives us access both to the internal aims and strategies of the research group, their interactions with different kinds of stakeholders, as well as their self-presentation for different stakeholders in funding applications and presentations at events.

The analytical strategy has followed a stepwise approach. First, we have met regularly to share and discuss field observations to make sense of the progress and the potential for societal impacts of different interactions. Second, and inspired by Mitchell (1997) and Reed et al (2009), we have mapped the problem area and the influence and interests of different stakeholders concerning the elderly's oral health, as well as with respect to each other. Based on this, we have analysed how the problem area is characterised by various gaps (see Boschma, 2005) that may condition the research group's prospect for having an impact. To analyse the strategies and tools the research group has used to raise awareness of the elderly's oral health, as well as their own salience and potential impact in the problem area, we have finally mapped the timeline of events, including the progress of the research and engagements with various stakeholders.

## Findings

We start the presentation of findings with an analysis of the problem area and the stakeholders, before moving to proximities and how the work evolved over close to six years.

### *The problem area and its stakeholders*

Our case is within oral health, a particular area of healthcare that is mostly left to the market (private dentistry labs and practitioners) in Norway, unlike other areas of healthcare that are taken care of for free by public hospitals, clinics and medical doctors that get reimbursed for their costs. Exceptions are found in oral healthcare for children and for the elderly in nursing and care homes (Spørre Saunes et al, 2020). This means that people are subject to private oral healthcare through their adult life

and transfer back to public care at a very late stage in life. In recent years, it has been observed that elderly patients have increasingly complex oral challenges, which is partly attributed to the success of public oral healthcare for children which has led to most people keeping their own teeth through their whole life (Gülcan et al, 2015). This requires closer follow-up of the elderly's dental health, as this may be crucial for healthy ageing. However, as we will show, oral healthcare and general healthcare for the elderly are subject to different stakeholders with varying degrees of power to influence the problem area depending on their access to political, economic, professional, and epistemic resources. Although these resources contribute to their potential impact in their field, they do not necessarily predict their sense of urgency and interest in engaging in the issue.

'The mouth is not part of the rest of the body' became the researchers' slogan to challenge the public-private divide, and it indicates several characteristics of the problem area. There are few national policymakers within oral health: only a few people within a large department in the Ministry of Health and Care Services, the organisation responsible for all municipal healthcare services, of which dental services is a tiny part. This means that political initiatives concerning oral health most likely have weak administrative support. A further consequence of the privatisation of dental care is that it only constitutes a minor portion of the state budget, making it an expense that is hidden from political scrutiny. In this sense, the problem area itself – the elderly's oral health – has a low salience on the national political scene. Although national policymakers have the ultimate political power and legitimacy to determine how oral health care is organised and provided, the lack of administrative support and concern over out-of-control financial costs seem to limit their sense of urgency and interest in elderly oral health compared to other issues.

In the regions, provision of oral healthcare is divided between the county level, which employs (some) dentists, and the municipal level which employs doctors and nurses who handle the elderly population's daily care, and which is subject to local budgets and governance (Sperre Saunes et al, 2020). Municipal budgets for healthcare are under constant pressure to cut spending, and one strategy to counteract increased spending has been 'active ageing': that people remain at home and receive health services there (Schönfelder et al, 2020). The transition to public oral healthcare while elderly patients are still living at home is, however, not a regular occurrence. Efforts to involve dentists from the county depend on local cooperation across organisational boundaries and whether oral problems are identified by the home nurses. This situation extends once the elderly enter a nursing home and, at this stage in life, many patients have severe oral health issues (Kvalheim et al, 2016). The degree to which public dental health services will initiate treatment here is therefore often framed as a question of economic cost benefits as well as overall health gains. The average length of stay in a nursing home is approximately two years (Helsedirektoratet, 2017).

Because of how public health services are set up for the elderly, there are several possible stakeholders at the local level with both the power and legitimacy to influence the problem area. Policymakers are ultimately responsible for local health services, including oral health, and they have a legal obligation to provide oral healthcare for the elderly patients. However, their influence depends on local collaboration across organisations, and between professionals with different priorities. Dentists have little control over older patients' routine dental treatment, and most treatments require moving the patient to the dentist's office. Municipal health services, which include

nursing homes and home care, have the daily responsibility for the physical wellbeing of the elderly, reflecting both their legal obligations and the expertise of individuals in charge of delivering the services. The people who are in the closest and most regular contact with the elderly: nurses and, to a lesser extent, doctors, have the immediate power to affect their oral health, yet do not necessarily see this as part of their jurisdiction and competence.

Furthermore, the professional division of labour in local health services reflects cognitive and organisational gaps in the higher education system, where dentists, nurses and doctors receive education and training in separate faculties of the universities. Despite having only indirect influence on the problem area, they have a significant impact on the professional identities and task perceptions of future professionals. Dental research is not as prestigious as many areas of medicine, and has not been a prioritised research area on its own. Instead, it is subordinate to medicine and health research in general, and competes for support from the same funding sources (Rorstad et al, 2014).

As for the elderly, they represent a great diversity of individuals, socioeconomically, culturally, and politically. Their experiences are not homogeneous, yet they are defined as a particular group through social policies (Hamblin, 2013), and the problem of the 'Elder Boom' is a regular topic in public debates in Norway (Christensen, 2018). The elderly themselves, however, are often marginalised in the political and public domain (Carney and Gray, 2015), and as they become more dependent on care, they become increasingly reliant on others to speak on their behalf. This can be relatives or patient groups who may have a strong interest in the issue but weak influence, unless they engage other actors, such as ombudsmen or the media who report to the public on pressing issues, potentially creating political momentums.

Regarding the research group in our case, it has limited influence in its own capacity. However, the purpose of bringing the group together was to strengthen their salience and use this to raise the attention and sense of urgency among other stakeholders. Their strategy, as we will return to, has therefore been two-pronged: to engage with and create alliances with stakeholders and to call for the urgency of the issue.

So far, we have outlined that oral health among the elderly is a complex problem area with many different stakeholders. These vary in how interested they are in dealing with relevant problems, and they vary a lot with respect to salience: their power to influence the issue and the legitimacy and urgency of their claims and actions. We have summarised this in Figure 1.

### *The evolving approach for achieving impact*

Establishment of the research group was motivated by an observation of how cognitive and organisational gaps in the problem area prevented effective treatment of the

**Figure 1: Stakeholders' combined salience and interest in the problem area of oral health among the elderly**

National and local policymakers	Care providers	Dental practitioners	Academia and research funders	Research group	Elderly and related patient groups
<ul style="list-style-type: none"> <li>• Strong salience</li> <li>• Weak interest</li> </ul>	<ul style="list-style-type: none"> <li>• Strong salience</li> <li>• Contingent interest</li> </ul>	<ul style="list-style-type: none"> <li>• Contingent salience</li> <li>• Strong interest</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect salience</li> <li>• Weak interest</li> </ul>	<ul style="list-style-type: none"> <li>• Indirect salience</li> <li>• Strong interest</li> </ul>	<ul style="list-style-type: none"> <li>• Weak salience</li> <li>• Strong interest</li> </ul>



elderly's oral health. The research group was therefore set up to bridge such gaps, resulting in a confluence of research on dry mouth, impact, and nanotechnology involving researchers from dentistry, pharmacy, social sciences, and medicine. Over six years, the orientation of the research group changed in a stepwise manner, and we attribute these changes mostly to accommodations to research funders' claims and feedback. Yet the changes also affected the research group's interactions with societal stakeholders, resulting in weaker interaction with stakeholders who hold a political and moral stake in the issue, and a stronger emphasis on bridging institutional and organisational gaps.

### *Solving society's grand challenges with a broad consortium of stakeholders*

Initially, the research group set out to solve a problem for a specific group of patients: dry mouth among elderly patients, especially those suffering from Sjögren's syndrome. In the researcher group's first application for research funding, the problem of dry mouth was presented as 'one of society's great challenges' and a widely prevalent but neglected condition. The project assembled a large team that would approach the issue from different disciplines, thus catering for the epistemic legitimacy of the project in a funding setting that required interdisciplinary research. To stress the urgency and severity of the problem, the application included dramatic photos of elderly patients' mouths.

The research group furthermore stated that it was 'driven by a goal to combine excellent research with a strong engagement for impacts on patients and oral health... We see impact as a long-term interactive and deliberative process oriented towards different types of impacts... for different stakeholders'. Consequently, the application identified a broad consortium of stakeholders, including policymakers, medical companies, healthcare professionals, professional associations, and patients, yet without distinguishing between their salience and stake in the problem area. Rather, the project group set out to engage with different stakeholders in parallel, and the project envisioned specific 'impact pathways' (Muhonen et al, 2019) to target the different stakeholders, including new medical treatment and diagnostics, as well as policy engagement and raising public awareness.

The project was evaluated as being strong on interdisciplinarity and in its efforts to engage stakeholders. Still, the funder rejected it, citing a lack of academic excellence and too narrow a focus in their rejection letter. Hence, the strategies and planned interactions did not materialise at this stage because of lack of funding.

### *Expanding the pathways to impact*

Rejection of the first application led to a broader framing of the problem area and more targeted ways of reaching stakeholders. The cited aim of the revised project was to bridge the gap between oral health and general health, by making oral health a more visible part of health policy, and to provide new solutions to ensure healthy ageing. More academic partners from medicine and informatics were included, and more pathways to impact were added. The revised project sought to develop a liposome-based product for dry mouths, a dental card to enable the nurses responsible for oral care to better understand individual needs, and improved interaction between healthcare professionals to reduce polypharmacy, especially drugs with reduced salivary

secretion as a side effect. Finally, the project wanted to implement an oral screening of the elderly to improve the knowledge base on their oral health, and to increase public and political awareness.

In this way, the project set out to enable different societal impacts in parallel, closely related to the three ideal types discussed in the literature: epistemological, artefactual, and interactional–institutional (Miettinen et al, 2015). Almost all stakeholders in the problem area were targeted in one way or another. Practitioners with high professional legitimacy and direct power to influence the elderly's oral health were seen as the most important stakeholders, and were included as primary users of all the research outputs. Other stakeholders, with less direct influence, were mainly perceived as general beneficiaries of the new knowledge from research.

The application was submitted to several potential funders; yet again, funding was denied, despite obtaining favourable evaluations on aspects relating to impact and interdisciplinarity. However, the research group did get limited 'seed funding' to advance the project, and these funds were mostly used to engage with stakeholders to lay the groundwork for future efforts. These interactions highlighted some of the difficulties in achieving impact in the problem area, which we tie to the constellation of salient but disinterested stakeholders. By this we refer to actors with power and legitimacy to address the elderly's oral health, but who expressed that this problem was less important and urgent than many other problems in which they had a stake. This contributed to gaps in encouraging research-based innovations and productive interactions.

### *Pursuing productive interactions with stakeholders*

With the seed funding, the research group held seminars to bring together relevant stakeholders and instil in them a sense of urgency to create a momentum for action. The first seminar in this phase brought together stakeholders from different areas of academia, including the technology transfer office of the university, to explore diagnostics and treatments of dry mouth. A major goal was to examine the likelihood of commercialising the liposome-based dry-mouth product, but it quickly became apparent that it faced significant obstacles. Going through the necessary clinical trials to marketise it as a medical treatment would require many resources. On the other hand, launching it as a cosmetic product would not be satisfactory to ensure the effects of the product, and would also call for a completely different marketing approach.

A subsequent seminar assembled nearly 50 diverse participants. They represented local-level policymakers, national and local health-oriented agencies, administrators and practitioners from nursing homes, associations such as the Norwegian Dental Association and the Senior Citizen Association, as well as representatives of several patient groups, different areas of academia (dentistry, medicine, informatics, and social sciences), and two politicians. Even if the seminar brought together many stakeholders, essential ones like national policymakers and academic representatives of the nursing profession were absent.

Retaining the emphasis on drawing more attention to the elderly's oral health, the welcoming introduction by the principal investigator set the stage with a series of alarming images of various conditions in elderly people's mouths, followed by statistics and figures that illustrated the prevalence and severe consequences of the conditions. The urgency evoked by the images and the 'hard facts' were difficult to

dispute, and a consensus seemed to emerge on the need for preserving good dental health among the elderly. But some dissident voices in the audience highlighted the challenges of translating words into actions in the problem area. Primarily, this concerned the costs and benefits of substantial dental procedures for the elderly, who were described as 'vulnerable' with 'a limited amount of time left to live'. Second, it was not clear who should oversee implementing new policies, and a number of problems were mentioned. This included the absence of public funding for dental treatment, ambiguous professional responsibilities, bodily care prioritised over oral care in the tight schedules of nursing homes, and the frequent neglect of oral care when the elderly are passed through the healthcare system.

Field trips to nursing homes to test the methods for charting elderly people's dental state, and the digital dental card, confirmed the claims about unclear responsibilities. The dentists worked far away from where the patients stayed and where the nursing staff carried out oral care, and some locations treated the dental equipment as private property, in contrast to all other medical devices. Nursing staff, moreover, highlighted their lack of training in providing such care.

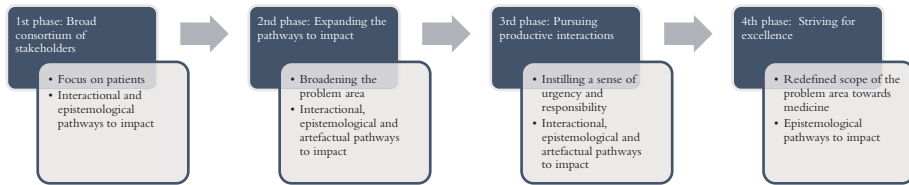
### *Striving for excellence*

Although the activities of the research group entailed extensive work with stakeholders, they also revealed the lack of commitment from key stakeholders and the need for substantial and long-term research funding to facilitate repeated interactions and scaling of activities. Several academic partners withdrew from the research group, and after an internal and informal evaluation, the research group again redefined the scope of the problem area, as well as the orientation of the research. In a new round of applications for research funding, the artefactual impact pathways were removed from the project, while the epistemological pathway was revised to support an interactional pathway. The new aim was to spur collaboration in multidisciplinary teams to better integrate care for elderly patients, and to bridge the gaps between municipal and hospital care and between professional groups. In addition to the emphasis on the organisation of oral care for the elderly, this was presented as a larger role for medical research, including a randomised controlled trial to test whether a model of cooperative medication review between general practitioners and hospitals could improve quality of life. Interactions with stakeholders outside of hospitals and nursing homes received less attention, and the interdisciplinary profile was toned down.

This time, the application for funding finally succeeded and the research group could proceed, yet with far narrower ambitions regarding potential pathways to impact and the scope of stakeholders involved in productive interactions (see [Figure 2](#)). At the time of writing, the research work has started, but without any major events that tie stakeholders to research beyond the significant practicalities of organising a clinical trial involving elderly and vulnerable patients.

## **Conclusion**

In this paper, we have sought to analyse why serious attempts at significant stakeholder interaction ([Mitchell et al, 1997](#); [Reed et al, 2009](#)) by researchers sometimes do not lead to impact, even if productive interactions with stakeholders is a key prescription in the literature on impact (for example, [Spaapen and van Drooge, 2011](#);

**Figure 2: Evolving approaches to impact**

Miettinen et al, 2015). This approach – analysing a case that may be perceived as unsuccessful – is our main contribution to impact and to related literatures such as evidence in policymaking (for example, MacKillop and Sheard, 2019; Bandola-Gill, 2021). The impact literature, in particular, is filled with examples of researchers who, through productive interaction with stakeholders, generate societal benefits.

Our analysis has a slightly different framing. We have not looked directly at how researchers generate impact, but at a problem area – oral healthcare for the elderly – where the researchers are but one of several relevant stakeholders with large differences in salience, interest in the issue, and sense of urgency. By following stakeholders and their characteristics and activities over six years, we have observed several gaps (see Boschma, 2005) that may serve as lenses into preconditions for research impact.

Many of the practitioners in the area (the care providers) did not have a background in dentistry, but are nurses or similar. An important gap is, therefore, not between researchers and practitioners but between different areas of research (general medicine versus dentistry) and professions in the nursing homes. The medicine/dentistry gap is partly also an organisational one as most of the day-to-day oral healthcare is carried out in nursing homes, yet dentists are mostly employed and located elsewhere. Similarly, education and research in these fields are organised in separate faculties at the university.

We furthermore observed that research funding maintains institutional gaps by striving for excellence, possibly at the expense of ‘user relevance’ or ‘impact’. This may be seen as an example of how stakeholders (in this case, the funders) with only indirect salience tied to the problem area may dictate the terms of researchers’ interactions. Stakeholders with political and moral legitimacy were to a lesser degree targeted as stakeholders when the project finally succeeded in obtaining funding, moving to a more traditional randomised controlled trial and one-way transfer of knowledge. This more conservative academic approach was framed in a way that made fewer of the funding area gaps relevant, but also in a way that reduced stakeholder interaction and impact ambitions.

In our case, no single actor had a clear responsibility for making sure that research perspectives and results were used in practice. This responsibility gap highlights challenges of healthcare-oriented projects that seek to change policies in areas with few, weak, or not-very-interested policymakers. What made the situation even more difficult was the low level of agreement about the nature and seriousness of the problem of elderly oral healthcare. Generally, stakeholders agreed that it was ‘an important issue’, yet disagreements arose, for example, about how severe the challenge of dry mouth really was, or about the importance of dental treatment in the final stages of life. An underlying issue was that elderly dental care needs were partly based on anecdotal evidence, with no agreed core of knowledge or statistics. This made it more difficult to create efficient pathways to impact.

We are reluctant to call the case a failure, as impact processes normally take many years and require complex longitudinal setups to be analysed properly. Our analysis points to some themes relevant for a larger-scale study, and it indicates that there might be a tension between policies striving for research impact and research excellence. Most importantly, it addresses how impact relies on factors that may be beyond researchers' control, such as the configuration of stakeholders in a problem area – a possibly useful construct also for other cases – and the stakeholders' interest in committing to change. Our setting is in Norway, a country with a strong public health system yet mostly privatised dental care. Still, the general analysis of the struggle of researchers to generate impact in a problem area with multiple and heterogeneous stakeholders is probably relevant in many other settings.

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### **Contributor statement**

Both authors have contributed equally.

### **Research ethics statement**

The study complies with the Guidelines for Research Ethics in the Social Sciences and the Humanities, provided by The National Committee for Research Ethics in the Social Sciences and the Humanities in Norway, as well as the Data Protection Service for research in Norway (Sikt).

### **Conflict of interest**

The authors declare that there is no conflict of interest.

### **References**

- Argyris, C. (1993) Knowledge for action: a guide to overcoming barriers to organizational change, *ERIC*, <https://eric.ed.gov/?id=ED357268>.
- Bandola-Gill, J. (2021) The legitimacy of experts in policy: navigating technocratic and political accountability in the case of global poverty governance, *Evidence & Policy*, 17(4): 615–33. doi: [10.1332/174426420x16000980489195](https://doi.org/10.1332/174426420x16000980489195)
- Benneworth, P. and Jongbloed, B. W. (2010) Who matters to universities? A stakeholder perspective on humanities, arts and social sciences valorisation, *Higher Education*, 59(5): 567–88. doi: [10.1007/s10734-009-9265-2](https://doi.org/10.1007/s10734-009-9265-2)
- Boschma, R. (2005) Proximity and innovation: a critical assessment, *Regional Studies*, 39(1): 61–74. doi: [10.1080/0034340052000320887](https://doi.org/10.1080/0034340052000320887)
- Carney, G.M. and Gray, M. (2015) Unmasking the 'elderly mystique': why it is time to make the personal political in ageing research, *Journal of Aging Studies*, 35: 123–34. doi: [10.1016/j.jaging.2015.08.007](https://doi.org/10.1016/j.jaging.2015.08.007)
- Christensen, K. (2018) Myten om eldrebølgen, *Myter om Velferd og Velferdsstaten*, 75–97. doi: [10.23865/noasp.47.ch4](https://doi.org/10.23865/noasp.47.ch4)

- Cohen, W.M. and Levinthal, D.A. (1990) Absorptive capacity: a new perspective on learning and innovation, *Administrative Science Quarterly*, 35(1): 128–52. doi: [10.2307/2393553](https://doi.org/10.2307/2393553)
- De Jong, S.P.L. and Balaban, C. (2022) How universities influence societal impact practices: academics' sense-making of organizational impact strategies, *Science and Public Policy*, 49(4): 609–20. doi: [10.1093/scipol/scac012](https://doi.org/10.1093/scipol/scac012)
- Falqueto, J.M.Z., Hoffmann, V.E., Gomes, R.C. and Onoyama Mori, S.S. (2020) Strategic planning in higher education institutions: what are the stakeholders' roles in the process?, *Higher Education*, 79(6): 1039–56. doi: [10.1007/s10734-019-00455-8](https://doi.org/10.1007/s10734-019-00455-8)
- Goffman, E. (1959) *The Presentation of Self in Everyday Life*, Garden City, NY: Doubleday.
- Gülcan, F., Ekbäck, G., Ordell, S., Lie, S.A. and Åström, A.N. (2015) Inequality in oral health related to early and later life social conditions: a study of elderly in Norway and Sweden, *BMC Oral Health*, 15: 20. doi: [10.1186/s12903-015-0005-y](https://doi.org/10.1186/s12903-015-0005-y)
- Hamblin, K. (2013) *Active Ageing in the European Union: Policy Convergence and Divergence*, Berlin: Springer. doi: [10.1057/9781137303141](https://doi.org/10.1057/9781137303141)
- Helsedirektoratet (2017) *Botid i Sykehjem og Varighet av Tjenester til Hjemmeboende*, Trondheim: Helsedirektoratet.
- Jongbloed, B., Enders, J. and Salerno, C. (2008) Higher education and its communities: interconnections, interdependencies and a research agenda, *Higher Education*, 56(3): 303–24. doi: [10.1007/s10734-008-9128-2](https://doi.org/10.1007/s10734-008-9128-2)
- Khanlou, N. and Peter, E. (2005) Participatory action research: considerations for ethical review, *Social Science & Medicine*, 60(10): 2333–40. doi: [10.1016/j.socscimed.2004.10.004](https://doi.org/10.1016/j.socscimed.2004.10.004)
- Kline, S.J. and Rosenberg, N. (1986) An overview of innovation, in R. Landau and N. Rosenberg (eds) *The Positive Sum Strategy: Harnessing Technology for Economic Growth*, Washington, DC: National Academy Press, pp 275–307.
- Kok, M.O. and Schuit, A.J. (2012) Contribution mapping: a method for mapping the contribution of research to enhance its impact, *Health Research Policy and Systems*, 10: 21. doi: [10.1186/1478-4505-10-21](https://doi.org/10.1186/1478-4505-10-21)
- Kostoff, R.N. (1993) Semiquantitative methods for research impact assessment, *Technological Forecasting and Social Change*, 44(3): 231–44. doi: [10.1016/0040-1625\(93\)90070-n](https://doi.org/10.1016/0040-1625(93)90070-n)
- Kvalheim, S.F., Strand, G.V., Husebø, B.S. and Marthinussen, M.C. (2016) End-of-life palliative oral care in Norwegian health institutions: an exploratory study, *Gerodontology*, 33(4): 522–29. doi: [10.1111/ger.12198](https://doi.org/10.1111/ger.12198)
- MacKillop, E. and Sheard, S. (2019) The politics of health policy knowledge transfer: the evolution of the role of British health economics academic units, *Evidence & Policy*, 15(4): 489–507. doi: [10.1332/174426418x15378681544353](https://doi.org/10.1332/174426418x15378681544353)
- Matt, M., Gaunand, A., Joly, P.B. and Colinet, L. (2017) Opening the black box of impact: ideal-type impact pathways in a public agricultural research organization, *Research Policy*, 46(1): 207–18. doi: [10.1016/j.respol.2016.09.016](https://doi.org/10.1016/j.respol.2016.09.016)
- Miettinen, R., Tuunainen, J. and Esko, T. (2015) Epistemological, artefactual and interactional: institutional foundations of social impact of academic research, *Minerva*, 53(3): 257–77. doi: [10.1007/s11024-015-9278-1](https://doi.org/10.1007/s11024-015-9278-1)
- Mitchell, R.K., Agle, B.R. and Wood, D.J. (1997) Toward a theory of stakeholder identification and salience: defining the principle of who and what really counts, *Academy of Management Review*, 22(4): 853–86. doi: [10.2307/259247](https://doi.org/10.2307/259247)

- Molas-Gallart, J. and Tang, P. (2011) Tracing 'productive interactions' to identify social impacts: an example from the social sciences, *Research Evaluation*, 20(3): 219–26. doi: [10.3152/095820211x12941371876706](https://doi.org/10.3152/095820211x12941371876706)
- Muhonen, R., Benneworth, P. and Olmos-Peñuela, J. (2019) From productive interactions to impact pathways: understanding the key dimensions in developing SSH research societal impact, *Research Evaluation*, 29(1): 34–47. doi: [10.1093/reseval/rvz003](https://doi.org/10.1093/reseval/rvz003)
- Pedrini, M., Langella, V., Battaglia, M.A. and Zaratini, P. (2018) Assessing the health research's social impact: a systematic review, *Scientometrics*, 114: 1227–50. doi: [10.1007/s11192-017-2585-6](https://doi.org/10.1007/s11192-017-2585-6)
- Reed, M.S., Graves, A., Dandy, N., Posthumus, H., Hubacek, K., Morris, J., Prell, C., Quinn, C.H. and Stringer, L.C. (2009) Who's in and why? A typology of stakeholder analysis methods for natural resource management, *Journal of Environmental Management*, 90(5): 1933–49. doi: [10.1016/j.jenvman.2009.01.001](https://doi.org/10.1016/j.jenvman.2009.01.001)
- Rørstad, K., Gunnes, H. and Wiig, O. (2014) *Kartlegging og Analyse av Tannhelse- og Odontologisk Forskning i Norge*, Oslo: NIFU.
- Schönfelder, W., Eggebø, H. and Munkejord, M.C. (2020) Social care for older people: a blind spot in the Norwegian care system, *Social Work in Health Care*, 59(9–10): 631–49. doi: [10.1080/00981389.2020.1847747](https://doi.org/10.1080/00981389.2020.1847747)
- Seim, J. (forthcoming) Participant observation, observant participation, and hybrid ethnography, *Sociological Methods & Research*, Online first. doi: [10.1177/0049124120986209](https://doi.org/10.1177/0049124120986209)
- Spaapen, J.B. and van Drooge, L. (2011) Introducing 'productive interactions' in social impact assessment, *Research Evaluation*, 20(3): 211–18. doi: [10.3152/095820211x12941371876742](https://doi.org/10.3152/095820211x12941371876742)
- Sperre Saunes, I., Karanikolos, M. and Sagan, A. (2020) Norway: health system review, *Health Systems in Transition*, 22(1): 1–163, <https://www.ecoi.net/en/file/local/2029906/HiT-22-1-2020-eng.pdf>.