

# Collaboration in Palliative Care Networks in Urban and Rural Regions of Switzerland

R. Schweighoffer, N. Nagy, E. Reeves, B. Liebig

**Abstract**—Due to aging populations, the need for seamless palliative care provision is of central interest for western societies. An essential aspect of palliative care delivery is the quality of collaboration amongst palliative care providers. Therefore, the current research is based on Bainbridge's conceptual framework, which provides an outline for the evaluation of palliative care provision. This study is the first one to investigate the predictive validity of spatial distribution on the quantity of interaction amongst various palliative care providers. Furthermore, based on the familiarity principle, we examine whether the extent of collaboration influences the perceived quality of collaboration among palliative care providers in urban versus rural areas of Switzerland. Based on a population-representative survey of Swiss palliative care providers, the results of the current study show that professionals in densely populated areas report higher absolute numbers of interactions and are more satisfied with their collaborative practice. This indicates that palliative care providers who work in urban areas are better embedded into networks than their counterparts in more rural areas. The findings are especially important, considering that efficient collaboration is a prerequisite to achieve satisfactory patient outcomes. Conclusively, measures should be taken to foster collaboration in weakly interconnected palliative care networks.

**Keywords**—Collaboration, healthcare networks, palliative care, Switzerland.

## I. INTRODUCTION

IN Switzerland there is a greater need for integrated and well-organized palliative care provision than ever, due to an ageing society and a continuously growing number of chronic diseases. Experts estimate that the percentage of individuals aged 65 years and over will increase from 18% in 2017, to 28% in 2050 [1], [2].

Like many European countries, Switzerland has recognized this demographic challenge and has increasingly invested into strategies in the last decade that aim on fostering integrated palliative-care services [3]. Among others, the Federal Office of Public Health (FOPH) established two National Strategies [4], [5], which promote new standards and best practices for palliative care and aim to improve education, research and the expansion of infrastructure and financing. However, ensuring sufficient palliative care (PC)-provision to all patients remains challenging in the current healthcare environment. This is mainly due to a decentralized healthcare structure and a rather high degree of local autonomy of the Swiss cantons when it comes to the implementation of national recommendations [6], [7].

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## A. Theoretical Perspective and Research Questions

The main aim of the study is to analyze the relationship between the extent of participation among palliative care providers in urban versus rural areas, and their perceptions of the quality of collaboration.

Recent studies report considerable cantonal differences in PC regarding provisional infrastructures, with differences found not only between cantons, but also between rural and urban contexts. The findings suggest that some cantons, and especially rural and remote areas, fall behind in terms of infrastructural prerequisites and subventions, whereas urban areas generally have sufficient infrastructure at their disposal, both in the specialized and in the outpatient area [8]-[10]. Further, numerous studies in western countries show, that urban regions are often better interconnected in terms of professional and institutional healthcare networks [11], [12]. Thus, we build on the assumption that bigger cities and agglomerations in Switzerland dispose of better interconnected PC-networks than rural areas. We further assume, that PC-providers report significantly more interactions in these areas than their counterparts in rural and remote areas due to spatial proximity and better established collaborative networks. Our assumptions were substantiated by a previous literature search for guidelines and documents for palliative care provision of different areas in Switzerland [13].

In Switzerland, primary palliative care (PPC) is being provided in an ambulant setting by family practitioners or nursing staff [5]. In contrast, specialized PC-providers (SPC, medical doctors and nursing staff, who are specifically educated in PC and oncology) typically treat patients in a stationary setting, and provide specialized care in the form of a more complex medical and psychosocial treatment [5]. In this study, we take into account a third group of suppliers, namely mobile palliative care teams (MPC's), who are specialized in PC, but who operate in an ambulant setting as an interface between PPC and SPC [6].

Our first hypothesis states, that healthcare professionals who work in PPC, SPC and MPC's report significantly higher rates of cooperation in more densely populated areas. Reported quantity of interactions between providers will be interpreted as the extent of embeddedness within (more or less institutionalized) palliative care networks [14].

In our second hypothesis, we build on the assumption that the quantity of interactions presuppose the perceived quality of interactions between PC-providers due to the familiarity principle or the mere exposure effect. The "mere exposure effect" states that mere repeated exposure of the individual to

a stimulus or, in this case, to another professional group, enhances one's attitude towards it [15]. Thus, our second hypothesis states that healthcare professionals of PPC, SPC and MPC's who report high quantities of interactions, are also more satisfied with the quality of collaboration.

### *B. Significance*

The main aim of our study is to analyze the statistical relation between the interactions of PC-providers in urban versus rural areas, and their perceptions of the quality of collaboration. 'Spatial' aspects of palliative care provision have been considered in much previous research [16], [17]. However, no studies have been conducted up to date on how spatial distributions of PC-providers might affect the extent and the perceived quality of collaboration.

## II. METHODS

### *A. Participants*

Primary physicians have been identified through the registry of the Swiss association of general practitioners and pediatricians "mfe". In order to reach nurses, specialized physicians and other professionals, a two-step recruiting approach (identification of organizations, contacting of employed or associated healthcare providers by the organization) was carried out. Supporting organizations, who distributed our survey to their staff and members, were amongst others palliative.ch, the Swiss association of general practitioners and pediatricians "mfe", the Swiss cancer league, Curaviva and various national and local nursing organizations.

Data collection was carried out between the 19<sup>th</sup> of September and 30<sup>th</sup> of November 2018. All respondents received an initial invitation to participate via email, and three rounds of reminders have been sent out within the following month. An informed consent form needed to be signed by each participant before starting the survey. A total of 4500 surveys were sent to healthcare providers (excl. reminders), with response rates of nearly 25%. A total number of 1111 healthcare providers involved in palliative care provision, took part in the study ( $F=64.7\%$ ,  $m=14.3\%$ , mean age= 50.9 years,  $SD=10.3$ ). Moreover, we made an emphasis during data collection to represent all three groups of PPC, SPC and MPC. The anonymity of responders was ensured at all times and data is being handled in accordance with the Swiss law governing the use of public data.

### *B. Measures*

The survey items have been adapted from Bainbridge's tool for evaluation of healthcare provision [14], and supplemented with items drawn from the Index of Interdisciplinary Collaboration (IIC) – 42 [18]. Items assessing basic demographic data of participants have been added (age, gender, occupational field, institutional affiliation). Survey questions were generated after reviewing them with the sounding board of the project composed of several physicians and specialists from the field of palliative care. The items have been reviewed for comprehensibility and validity and a pretest has been conducted preceding data collection. The final

questionnaire has been composed in an online survey provider and delivered via email in German, French and Italian language. Based on current guidelines for generating cross-language survey instruments, the items of the questionnaire have been translated in a multistage process [19], [20]. Several members of the research team tested the final version of the survey in every language and assessed the time required for completion.

The geographical differentiation of urban versus rural areas has been made according to the guidelines of the Federal Institute for Building, Urban Affairs and Spatial Research of Germany [21]. Following these guidelines, we decided to work with the following five categories: 1.) big cities  $\geq 100,000$  inhabitants, which are the cities of Zurich, Geneva, Basel, Berne, Lausanne and Winterthur; 2.) larger cities  $\geq 20,000$  and  $< 100,000$  inhabitants; 3.) small towns  $\geq 10,000$  and  $< 20,000$  inhabitants; 4.) agglomerations or villages in an urban catchment area  $< 10,000$  inhabitants; 5.) small villages, including settlements in remote regions and mountain regions  $< 10,000$  inhabitants.

The number of interactions between all types of healthcare professionals was assessed with a 6-point Likert scale for a time period of 12 months, with an answer format of 1 (I worked with this healthcare-provider at least once per day) to 6 (I never worked with this healthcare-provider). Quality of interaction between all types of healthcare providers was assessed with a 6-point Likert scale with an answer format of 1 (collaboration with this group of professionals is usually very difficult) to 6 (collaboration with this group of professionals is very easy). The variables have been recoded for further statistical analysis.

## III. RESULTS

Response data have been analyzed with SPSS 24 [22]. Results are being reported in 1 (Correlation table of the study variables) and Tables II.A and II.B (Regression tables of the study variables).

Firstly, we investigated the intercorrelations between all our study variables (spatial distribution, quantity and quality of collaboration between PPC, SPC, and MPC). The spatial distribution of healthcare providers correlated positively with quantity of collaboration ( $r = 0.15^{**}$ ,  $p < 0.01$ ), as did the quality of collaboration ( $r = 0.07^*$ ,  $p < 0.05$ ).

Quantity of collaboration (number of interactions between healthcare providers) significantly correlated with perceived Quality of collaboration ( $r = 0.11^{**}$ ,  $p < 0.01$ ), denoting that in urban areas, PC-providers indeed reported better perceived interactions with their peers. The results of the analyses can be found in Table I.

Addressing our first hypothesis, we assumed, that urban areas show more interactions between PC-providers due to a denser infrastructure, than rural areas.

In order to test the first hypothesis, a regression analysis has been conducted to predict the quantity of cooperation based on the geographical distribution of palliative care providers. The results of the regression showed a significant relation between spatial distribution and number of interactions: ( $F=1 / 1067$ ) =

24.699,  $p < 0.000$ ), with an  $R^2$  of 0.023, signaling that spatial distribution significantly predicts the amount of interactions between PPC, SPC, and MPC.

Our second hypothesis builds on the assumption that the amount of interactions will have a positive effect on perceived quality of interactions due to the mere exposure effect. Therefore, a second regression analysis has been conducted to predict quality of cooperation based on the quantity of collaboration between PPC, SPC, and MPC. The postulated regression was significant:  $(F=1 / 1057) = 12.712$ ,  $p < 0.000$ , with an  $R^2$  of 0.012 (see Table I), signaling that the quantity of cooperation significantly predicted the quality of cooperation.

In summary, we hypothesized, that urban areas would show

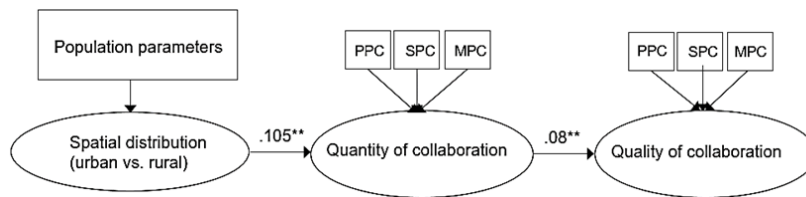
a higher number of interactions and higher rates of perceived collaboration. Both of our hypotheses could be statistically substantiated and yielded significant results.

#### A. Figures and Tables

TABLE I  
CORRELATION TABLE OF THE STUDY VARIABLES GEOGRAPHICAL DISTRIBUTION (POPULATION DENSITY), QUANTITY, AND QUALITY OF COLLABORATION BETWEEN PPC, SPC, AND MPC

	1.	2.
1. Spatial distribution	1	
2. Quantity of collaboration	0.150**	
3. Quality of collaboration	0.073*	0.109**

$N = 1056$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$



$N = 1056$ ; \*  $p < 0.05$ ; \*\*  $p < 0.01$ .

Fig. 1 Analytical model of the relationships between geographical distribution (population density), quantity, and quality of collaboration between PPC, SPC, and MPC

TABLE II.A  
REGRESSION TABLE OF THE STUDY VARIABLES OF GEOGRAPHICAL DISTRIBUTION (POPULATION DENSITY) AND QUALITY OF COLLABORATION BETWEEN PPC, SPC AND MPC.

Variable	Population density		
	B	SE B	$\beta$
Quantity of collaboration	2.675	0.074	0.150
$R^2$		0.023	
F		24.699	

\* $p < .05$ ; \*\* $p < .01$

TABLE II.B  
REGRESSION TABLE OF THE STUDY VARIABLES OF QUANTITY OF COLLABORATION, AND QUALITY OF COLLABORATION BETWEEN PPC, SPC AND MPC

Variable	Quantity of Collaboration		
	B	SE B	$\beta$
Quality of collaboration	4.255	0.072	0.109
$R^2$		0.012	
F		12.712	

\* $p < 0.05$ ; \*\* $p < 0.01$

#### IV. DISCUSSION

To date, no research has been conducted concerning the influence of spatial variables on the extent and perceived quality of collaboration between healthcare providers in the field of palliative care. Our results show that there are significant differences in perceived quantity and quality of interactions between SPC, PPC and MPC, depending on where their workplace is geographically located. Results indicate that in densely populated areas, PC-providers report higher rates of interactions and are more satisfied with their collaborational practice, than in rural and remote areas.

This means that PC-providers who work in urban areas are

indeed better embedded into collaborational networks than their counterparts in more rural areas. Furthermore, we conclude from our results that good collaborative practices require a high level of embeddedness of care providers into PC-networks.

It is of paramount importance that collaboration between palliative care providers and their embeddedness into networks are further examined in the future, in order to guarantee seamless palliative care provision for an ageing society. Efficient communication between palliative care providers is essential to reduce information gaps, which could impair patient outcomes and lead to medical errors [23]-[25].

Numerous recent research findings indicate that telehealth (i.e. the remote exchange of data via communication technologies such as computers and mobile devices) will facilitate collaboration between healthcare providers in the future, especially across rural areas [26], [27]. Therefore, PC-providers, who are unable to have regular face-to-face meetings or phone conversations due to spatial distances or busy schedules, could benefit from the introduction of e-tool applications, such as shared electronic patient information systems, which should be specifically tailored to the needs of the highly interprofessional field of palliative care.

Further research is needed to investigate how the individual cantons of Switzerland differ regarding interprofessional collaboration in PC, so that appropriate measures can be taken on a local level. Studies investigating similar issues in the future might benefit from the use of tools such as standardized electronic patient records, GPS data and applications, which can precisely track human interactions.

#### A. Limitations

It has to be noted that the gender distribution of our study

sample was unbalanced with about 80% of participants being female. This might be explained by the high proportion of nurses who took part in our study (38%), as typically, up to 90% of nurses in Switzerland are female [28]. Further, it is important to underline that the current study is based on retrospective, self-report data, which has certain limitations in terms of reliability and validity. Therefore, future research could benefit from the usage of smartphone apps, which are able to accurately quantify human interactions, to obtain truly objective measures of collaboration. Finally, it is noted that the spatial distribution of palliative care providers in the current form serves exclusively comparative purposes, as not all phenomena and trends can be represented by this kind of typification of urban and rural areas. Hence, future studies investigating similar topics might use tools such as standardized electronic patient records, GPS data and applications to track human interactions with a higher grade of precision.

#### V.CONCLUSION

The spatial distribution of palliative care providers significantly impacts the extent of their collaboration, which in turn influences the perceived quality of collaboration. Given that the Swiss population is continuously ageing, it should be of high relevance for policy makers to specifically improve collaboration in rural and remote areas, in order to guarantee seamless palliative care provision and satisfactory patient outcomes.

#### DECLARATION OF CONFLICTING INTERESTS

The authors declared no conflicts of interest with respect to the research, authorship or publication of this article.

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Formal research approval for this study was obtained from the Ethics Committee of Northwestern Switzerland (EKNZ).

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