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Health policy for telestroke in France: a retrospective description from 2003 to 2016

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Running title: Description of policy for telestroke in France

Abstract:

Introduction: Stroke is a public health priority in France. The use of telemedicine for stroke known as telestroke, is a safe and effective practice improving access to acute stroke care including thrombolysis. Telestroke is currently being implemented in France. The objective was to describe the public health policy supporting telestroke implementation in France.

Methods: An external ex-post evaluation of telestroke policy in France was conducted through a retrospective descriptive study from 2003 to 31st December 2016. Process, content, and actors of the health policy were described at a national level. The logical framework of the telestroke policy was described. The stages model of public policy from the *'Institut National de Santé Publique du Quebec'* was used.

Results: Agenda setting was produced from 2003 to 2007. Policy formulation lasted from 2008 to 2009 with official reports on telemedicine, telehealth and stroke. The decision-making stage included the national stroke plan, the national telemedicine implementation strategy and an administrative document in 2012 that described the organization of telestroke implementation. Implementation in 2011 was initiated with dedicated funding and methodological resources. No dedicated evaluation of policy for telestroke was defined.

Conclusions: Using a health policy model allowed to describe the policies supporting telemedicine implementation in France and to highlight the need for better evaluation.

Keywords: Evaluation; Health Policy; Telemedicine; Stroke;

Introduction

Stroke is the first cause of adult acquired disability, the second cause of dementia, and the second cause of mortality for women in France [1]. The annual incidence of stroke has been estimated to be 150,000 cases in France with a prevalence of 400,000 cases [2]. The economic burden of stroke has been estimated around 8.3 billion euros annually [3,4]. As a result, stroke was recognized as a public health priority in France in 2003 by the Ministry of Health (MOH) [5].

The treatment of cerebral infarction with thrombolysis is conducted in comprehensive stroke centres (CSC) and primary stroke centres (PSC). Thrombolysis needs to be within a limit of 4 and half hours. The limited supply and resource of neurologists, however, do not allow adequate number of CSC openings to cover medical needs [6,7].

The use of telemedicine for stroke, known as telestroke, allows the practice of thrombolysis in the emergency unit (EU) with the support of CSC or PSC. The practice of telestroke has been developed since the 2000's in North America and Europe [8]. Telestroke was demonstrated to be a safe and effective practice in improving access to stroke diagnostics and providing treatment inclusive of thrombolysis [9]. In 2016, several regions in France were implementing telestroke into acute stroke care [10]. However, to date, no description of health policies impacting telestroke have been conducted to understand how telestroke implementation may have been supported in France. The objective of this study was to describe the public health policies supporting telestroke implementation in France.

Methods

A summative external ex-post evaluation of telestroke health policy in France was conducted. The evaluation was performed through a retrospective descriptive study from 2003 to December 31st 2016. Process, content and actors of the health policy were described at a national level. The logical framework of the telestroke policy was described using the High Council on Public Health (*Haut Conseil de Santé Publique*, HCSP) model (Figure 1) [11].

The stages model of public policy from the '*Institut National de Santé Publique du Quebec*' (INSPQ) developed from the Howlett and Ramesh model was used to describe the process of telestroke health policy in France [12,13]. This model includes five stages, agenda setting, policy formulation, decision-making, implementation, and evaluation.

A document and legislation analysis was conducted to collect data from the Ministry of Health (MOH) and health agencies reports on stroke, telemedicine and telestroke. Health agencies in France were a) the High Authority on Health (*Haute Autorité de Santé*, HAS), b) the '*Agence des Systèmes d'Information Partagés de Santé*' (ASIP), c) the National Support Agency for the Performance of Health and Medico-Social Facilities in France (Agence Nationale d'Accompagnement à la Performance, ANAP), and d) HCSP. Legislation was described from the Legifrance online database.

Results

Agenda setting lasted from 2003 to 2007. The use of telemedicine in stroke was first mentioned in the initial national report of telemedicine in France in 2003 [14]. An administrative document ('*circulaire*') from 2003 organizing stroke care pathways stated that CSC should have operational telemedicine equipment [5]. The document described that hospitals with stroke care that were not CSC or PSC may be supported with the use of telemedicine. In 2007, another '*circulaire*' stated that the role of telemedicine for CSC or PSC was to support other hospitals [15]. This first stage initiated the potential use of telemedicine within the organization of stroke care in France.

Policy formulation stage included three reports made for the MOH of France in 2008 and 2009 on telemedicine, telehealth, and stroke. The report on telemedicine stated that telestroke could reduce inequities in access to thrombolysis [16]. The report made by parliament members on telehealth cited the Franche-Comté region telestroke project as an example [17]. The word "telestroke" was first used in the national report on stroke care organization improvement from 2009 [3]. It was recommended in this report to integrate telestroke in acute stroke care with a regional scale implementation. The use of teleconsultation in neurology and teleradiology for stroke care were described in the report. The decision-making stage lasted from 2010 to 2012. It included the national stroke plan for 2010 to 2014, the national telemedicine implementation strategy initiated in 2011, and a '*circulaire*' on the organization of stroke care in 2012. The use of telemedicine in stroke was part of the action 8.1 of the second axis of the national stroke plan [18]. The objectives stated in the plan were to prepare telestroke implementation protocols and regional pilot testing followed by national implementation. The operational implementation in administrative regions was planned to be under authority of the regional organization in

charge of health information systems and telehealth implementation. The implementation of telestroke was integrated into the national telemedicine strategy as one of the five priorities [19]. The '*circulaire*' stated that the EU had to be linked with CSC or PSC and described the type of telemedicine necessary for telestroke, the telestroke model of care and key success factors including monitoring and evaluation [20].

The implementation stage included dedicated funding for telestroke implementation, support for regional pilots and methodological resources. A public funding of 11.6 million euros was attributed in 2011 for 13 telestroke projects [21]. Regions with allocated funds were Auvergne, Basse-Normandie, Bourgogne, Bretagne, Champagne-Ardenne, Haute-Normandie, Ile-de-France (IDF), Franche-Comté (FC), Languedoc-Roussillon, Limousin, Midi-Pyrénées, Nord-Pas-de-Calais (NPDC) and Rhône-Alpes. In 2015, 24 projects were publicly funded, however, the amount of funding varied across regions [22].

Three regions, Bourgogne, FC and NPDC, were selected in 2012 to be pilot projects supported by the MOH, ANAP, ASIP and HAS [23]. ANAP described the telestroke projects in two guides related to telemedicine and in a guideline document for regional telestroke implementation [24,25]. Additionally, a medico-economic study based on the pilots was conducted but not made publicly available nor published [26].

Methodological resources were produced by the MOH in 2012. A section on telestroke was included in the guidance documents on regional telemedicine program definition [27], medico-economic evaluation for telemedicine and telemedicine project management [28,29]. Clinical quality of care indicators for telestroke were defined by HAS in 2013 to monitor telestroke quality of care among hospitals [30].

No dedicated evaluation of health policy effectiveness for telestroke was identified. The proposal of HCSP for the evaluation of the national stroke plan did not include telestroke [31]. Few studies were however conducted at national level related to telestroke implementation. A survey conducted by the MOH in 2012 identified 27 telestroke projects, which represented 10% of telemedicine projects known in France [32]. Another survey conducted in 2013 by the MOH identified 30 projects in 23 regions, with half of projects being operational [33]. A survey conducted in 2014 by HAS on quality indicators identified 21% of hospitals having telestroke equipment with 24 hubs (CSC or PSC), 74 spokes (PSCS or EU) and 14 both hub and spoke (Table 1) [34,35]. Among spoke hospitals, 12% of stroke cases had used telestroke. A map of telestroke implementation was created by HAS in 2016

(Figure 2). The data, however, did not allow a description of telestroke activity or effectiveness by region. The five stages are presented in Figure 3.

Discussion

The policy stages model used in the study allowed to retrospectively describe all stages of public health policies supporting telestroke implementation in France. The policy development took eleven years between the first official document in 2003 and the guideline report from pilot projects of ANAP published in 2014 as well as the first survey from HAS. The agenda setting was the longest stage, and policy formulation and decision-making stages were conducted only under one government from 2007 to 2012. Policy formulation stage was influenced by medical experts and feedbacks from the first telestroke project in France but did not include referenced scientific literature evidence on telestroke. The total financial investment for telestroke implementation was not known due to the lack of financial monitoring at national and regional levels.

One of the reason for the lack of dedicated policy evaluation at national level may have been the lack of public policy evaluation from 2012 to 2017, particularly relating to policy effectiveness [36]. The evaluation may have been conducted by the HCSP as part of the evaluation of the national stroke plan. The evaluation of the stroke plan was, however, not performed as the HCSP was not requested by the Ministry of Health to conduct it. If conducted, these evaluations would nonetheless have been retrospective while the World Health Organization promote prospective monitoring and evaluation of health policies [37]. To support this concept, it may be relevant to consider regulatory mandatory evaluation of health policy in France [38].

The absence of a formal request for health policy evaluation by patients, healthcare professionals and researchers may also have influenced the lack of a telestroke health policy evaluation. The evaluation of telestroke in France may have been limited as results on telestroke were already published with a high-quality level of evidence from other countries. However, irrespective of high-quality level of evidence, the evaluation of telestroke implementation should depend relatively on the context of implementation with a public health intervention research approach [39].

A national telestroke study supported by the MOH and based on the scientific evaluation of regional telestroke implementation may be useful to assess the effectiveness of health policies related to telestroke in France.

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Sarina Yaghobian

Conflict of interest

The authors declare that they have no conflict of interest concerning this article.

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Table 1. Number of hospitals with telestroke per region in 2014 in France according to HAS

| Region | Number of hospitals with telestroke |
|----------------------|-------------------------------------|
| Alsace | 1 |
| Aquitaine | 4 |
| Auvergne | 3 |
| Basse-Normandie | 1 |
| Bourgogne | 12 |
| Bretagne | 1 |
| Centre | 1 |
| Champagne-Ardenne | 3 |
| Corse | |
| Franche-Comté | 7 |
| Guadeloupe | 2 |
| Guyane | 1 |
| Haute-Normandie | 4 |
| Ile de France | 15 |
| Languedoc Roussillon | 4 |
| Limousin | 3 |
| Lorraine | 6 |
| Martinique | 1 |
| Midi Pyrénées | 7 |

| | |
|--------------------|---|
| Nord Pas de Calais | 6 |
|--------------------|---|

| | |
|---------|--|
| Réunion | |
|---------|--|

| | |
|------|---|
| PACA | 6 |
|------|---|

| | |
|------------------|---|
| Pays de la Loire | 2 |
|------------------|---|

| | |
|----------|---|
| Picardie | 2 |
|----------|---|

| | |
|------------------|--|
| Poitou Charentes | |
|------------------|--|

| | |
|-------------|----|
| Rhône-Alpes | 19 |
|-------------|----|

Figure 1. Logical framework of telestroke policy in France

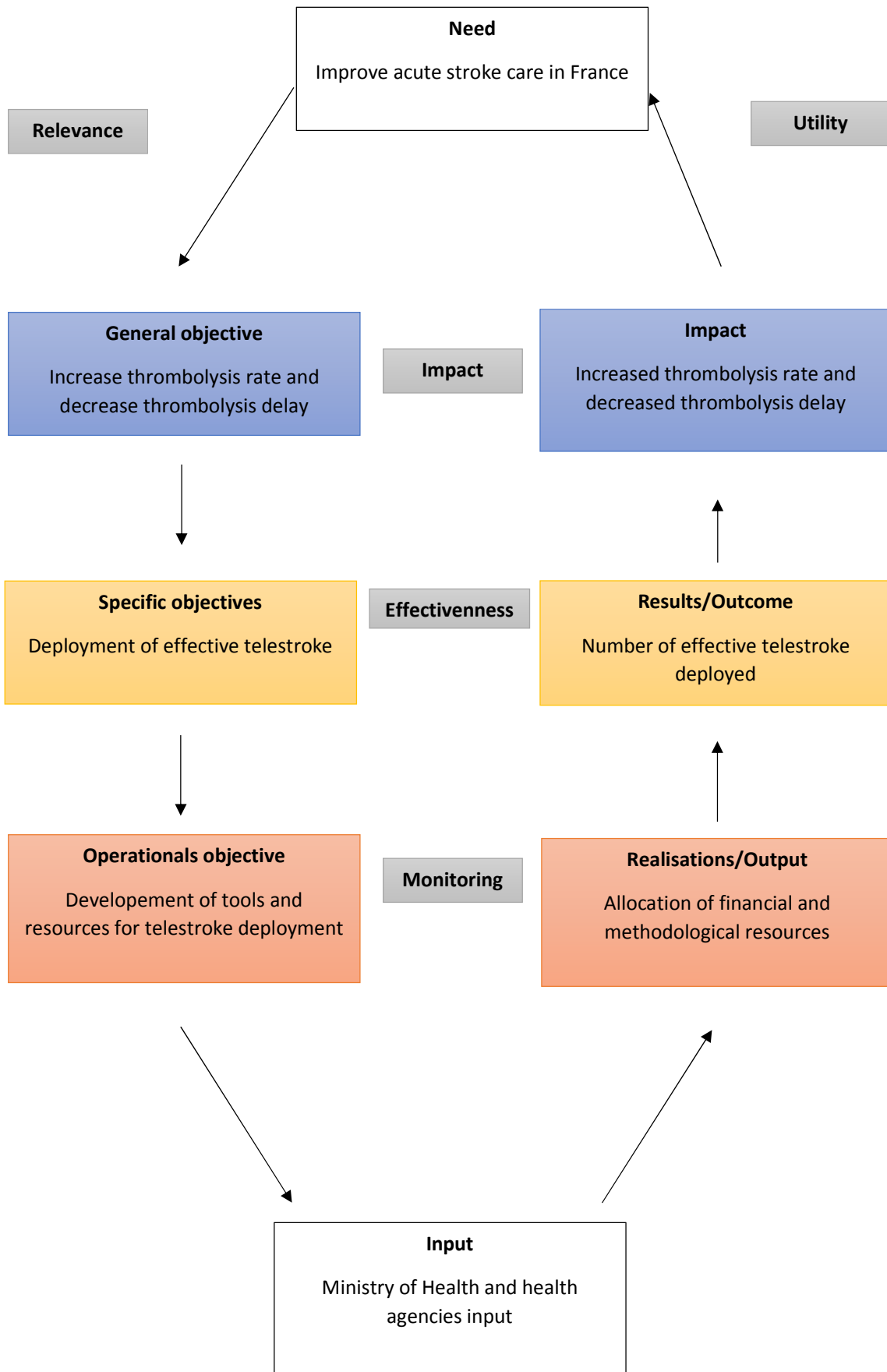
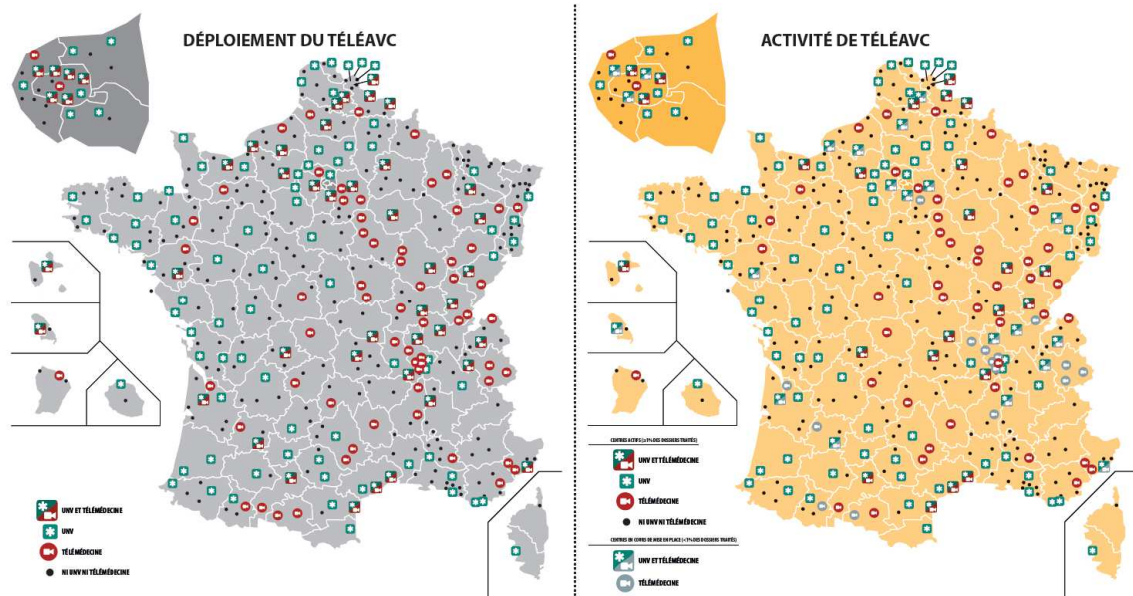


Figure 2. Deployment of telestroke in hospitals in France in 2016 according to HAS



Source : Bouamra et al. Le déploiement du TéléAVC en France : Un point d'audimat proposé selon les critères HAS. Poster, 9^e congrès de la Société Française de Télémedecine, 1^{er} et 2^e Décembre 2016, Paris.

Figure 3. Telestroke public policy stages model in France from 2003 to 2016

