

Improving Access to Frontline Psychosocial Services for Youths in Difficulty by Using Lean Approach: A Case Study in Montreal

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Abstract. In the province of Québec, Canada, the first significant psychosocial intervention in frontline services, aimed at supporting children and youths in difficulty and their family must take place within a maximum of 30 days for at least 75% of the clients. However, meeting this response deadline is not easy to achieve. This was observed in the Youth Programme of an integrated university centre of health and social services in Montreal. In 2017, the average delay between the reception of a service request and the first significant intervention was 57 days. 40% of the clients had their first intervention within 30 days, and 67% within 60 days. Following action research methodology, a Lean approach was implemented within the Youth Programme and a Kaizen event was performed, bringing together employees, managers, partners, and a partner-client. After the implementation of the proposed solutions, 69% of the clients have now had their first significant intervention within 30 days, and 91% within 60 days. Improving accessibility to frontline services also led to improving accessibility to second-line services. This paper presents our approach and lessons learned in order to help other programmes to develop their own roadmap to improve accessibility to their services.

Keywords. Accessibility, frontline psychosocial services, youths in difficulty, Lean, Kaizen event, action research.

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1. Introduction

Recently, major organisational changes have occurred in the health network in the province of Quebec, leading to the creation of 22 integrated (university) centres of health and social services, referred to as CIUSSSs and CISSSs (Centre Intégré (Universitaire) de la Santé et des Services Sociaux) (MSSS, 2016a). CIUSSSs/CISSSs encompass several facilities such as local community service centres, hospital centres, and children and youth protection centres. Their mission is to offer a wide range of general and specialised health and social services to the population while ensuring accessibility, efficiency, and quality. The CIUSSS Centre-Sud-de-l'île-de-Montréal (CCSMTL), where this project was conducted, is the largest integrated university centre in the Montreal region. It was created on April 1, 2015 and accounts for 17 000 employees and 300 000 clients over 46 km² surface territory. Accessibility to frontline psychosocial services for youths in difficulty (i.e. children, youths and their family) was a major concern of the Youth Programme, one of the Service-Programmes of the CCMTL. This project, which started in March 2017, aims to improve access delay to those services. This is essential because providing rapid services to the clients allows them to satisfy their needs at the right time, which avoids a worsening of their situation while reducing the number of clients referred to second-line services. In this regard, the MSSS prescribes a maximum delay of 30 days between the reception of a service request and the first significant intervention for at least 75% of the clients.

Accessibility is a major problem observed in many health and service institutions worldwide. We used the Lean approach within action research methodology, to identify and analyse the causes of the problem, and rapidly identify and implement client-centred solutions to improve the service access process while involving employees, managers, partners, and clients. According to Cookson et al. (2011), similarly to the manufacturing sector, Lean is relevant for healthcare systems because

they comprise multiple departments, long and complex processes with varying cycle times, queuing and resource sharing to provide services. Therefore, Lean is appropriate for psychosocial service accessibility problem. Indeed, the Youth Programme of CCSMTL presents multiple sites, diversified services and complex processes. In addition, multiple actors (clients, employees, managers, partners, policy makers, etc.) having major impact on the process efficiency and service quality are involved in the system. More precisely, we used DMAIIC framework (Define, Measure, Analyse, Innovate, Implement, and Control). Within each DMAIIC phase, we used different Lean techniques that we combined with a Kaizen event.

This work contributes to the body of knowledge in Lean healthcare in both practice and the theory. It addresses three major gaps in the literature. First, the study focusses on a large and complex system encompassing two territories, each including multiple access service points and multiple multi-disciplinary teams providing services to diversified clients (children, youths, and their family), and interacting with multiple internal and external departments and partners (doctors, psychosocial reception, second-line services, schools, etc.) Mazzocato et al. (2010) and Costa and Godinho Filho (2016) found in their literature reviews (33 and 107 reviewed articles, respectively) that most publications are limited to applications of Lean to specific processes within a unit or a department. Second, our study covers a period of time of more than two years (March 2017 to July 2019), and describes in detail all steps of the project, from managerial motivation to implementation and lessons learned. It provides a description of the tools/techniques used and the results obtained at each phase as well as the results of solution implementation. In the literature, a few studies describe the motivation, implementation and sustainability of Lean (Costa and Godinho Filho, 2016; Filser et al., 2017; Cory et al., 2018; Antony et al., 2019). To Cory et al. (2018), there is limited empirical research assessing Lean implementation, specific tools being used, wastes

being reduced, quality improvements achieved, and how transformation is sustained. To Costa and Godinho Filho (2016), most studies do not mention information that could help facilitate and accelerate Lean healthcare implementation such as implementation period, improvement opportunities, tools used, obstacles, success factors, and results obtained. In this study, we identified 10 success factors (e.g. top management commitment, leadership, employee engagement, staff empowerment, multidisciplinary team, communication, and customer focus) and five challenges (process complexity, Kaizen team size, Lean vocabulary, solution election, and completion time for implementing the solutions). Finally, a few works used Lean approach to address the problem of service accessibility, regarding more specifically psychosocial and mental health services. Costa and Godinho Filho (2016), identified only four studies using Lean thinking in mental health centres. This study provides a model for researchers and practitioners to build their own roadmap to address complex issues in healthcare such as accessibility to services, and to improve their client care experience.

The remainder of the article is organised as follows: the next section presents the context and problem. Section 3 introduces Lean healthcare and presents a literature review on the problem of service accessibility. Section 4 describes our methodology. Section 5 presents the project phases, tools/techniques used and the results of each phase. The results, lessons learned, and contributions to practice and the theory are discussed in Section 6. Finally, our conclusions are presented in Section 7.

2. Context and Problem

In the province of Quebec, the healthcare and social service system is structured as Service-Programmes and Support-Programmes (MSSS, 2016a). The Youth Programme is one of the nine Service-Programmes of the province. Youth Programme offers a range of services dedicated to

young people (and their family), who suffer from problems of development, behaviour, or social adjustment (violence, delinquency, suicide, etc.), from early childhood to adulthood (MSSS, 2009). Frontline psychosocial services aim at offering help and support to youths and their family, in mid and long terms, in order to avoid a worsening of their situation and address their social adjustment issues or the consequences that might result from their psychosocial problems (MSSS, 2009). From 2006 to 2009, services offered to youths and their family increased by 15.4% (MSSS, 2009). In 2014-2015, 36% of young people from 15 to 24 years old showed a high level of psychosocial distress (MSSS, 2016b).

The Youth Programme of CCSMTL offers frontline and second-line psychosocial services. This project focusses on frontline services, provided in two local territories in Montreal, Southwest Verdun (SWV), and Jeanne Mance (JM). These two territories have been under the responsibility of the Youth Programme since April 2015. SWV territory includes three local community service centres, which are the access points to psychosocial services for the clients. JM includes four centres. Both SWV and JM territories encompass two multidisciplinary teams composed of social workers, educator psychologists, psychologists, etc. who offer services to children 0-5 years old and their family (early childhood services), and youths 6-17 years old (SWV) and 6-20 years old (JM) and their family (child-youth and scholar services).

The Youth Programme was facing challenges that jeopardised accessibility to frontline services for its clients. In 2017, the average delay between the reception of a service request and the first significant intervention in the two territories of SWV and JM was 57 days. 40% of the clients had their first intervention within 30 days, and 67% within 60 days. At SWV, 37% of the clients received their first intervention within 30 days and 63% within 60 days. The average delay was 68 days for SWV. At JM, 47% of the clients had their first intervention within 30 days and 73%

within 60 days. The average delay was 45 days for JM. This project aimed at improving the delay for both SWV and JM and achieving MSSS's prescription. More precisely, the objective of the Youth Programme Executive Director is to allow 75% of its clients to obtain their first significant intervention within 30 days and 100% within 60 days.

3. Lean in Healthcare and Literature Review

This section is divided into two parts. First, we briefly introduce Lean healthcare. Second, we present a literature review on different approaches used to address the problem of service accessibility, with an emphasis on Lean-oriented approaches.

3.1 Lean in healthcare

Lean is an improvement approach that first appeared in the manufacturing sector. It was developed by the Japanese company Toyota in the 1950s, and was initially known as the Toyota Production System (TPS) (Laite et al., 2019). Later, it became popular through the book "The Machine That Changed the World" written by Womack, Jones and Ross (1990) (Pinto et al., 2018), and was referred to as "Lean thinking" by Womack et al. (1990) (Laite et al., 2019). Nowadays, Lean is widely implemented in both manufacturing and service sectors. In healthcare, the original application of Lean appeared in 2000 in the UK followed by 2002 in the USA (Radnor et al., 2012). One popular Lean implementation initiative widely cited in the literature is by The NHS Institute for Innovation and Improvement in the UK (Antony *et al.*, 2019). Lean focuses on eliminating waste (activities that do not add value to the client) and producing products (or services) of high quality to satisfy the final customers (Ohno, 1988; Shingo, 1989). To this end, Lean uses a set of tools and techniques such as stakeholder analysis, value stream mapping, 5S, value added analysis, visual management, Kanban system, cellular manufacturing, 5 why, cause and effect, and Pareto analysis (Chen and Lyu, 2009). In healthcare, the main goal is to improve the client care experience

by understanding what is valuable to the client and identifying activities that directly contribute to what he/she desires (Fisler et al., 2017). Similarity to the manufacturing sector, in healthcare, Lean focuses on the systematic elimination of waste (Costa and Godinho Filho, 2016). Seven categories of waste are commonly considered, which can be adapted to healthcare (Toussaint and Gerard, 2010): waiting (e.g. for an appointment), motion (e.g. searching for drugs), transportation (e.g. transferring patients to new rooms), overproduction (e.g. unnecessary treatment), defect (e.g. inspecting work already done), over-processing (e.g. unnecessary forms) and inventory (e.g. overstocked or understocked drugs). Additional wastes such as talent (e.g. failure to train emergency technicians in new diagnostic techniques) also apply to healthcare (Costa and Godinho Filho, 2016).

Employee empowerment and continuous improvement are also two important principles of Lean (Brandao de Souza, 2009). Kaizen event is an example of a technique used in Lean projects for training employees (cross-functional team) and helping them develop solutions within a short timeframe (1 week or less) and increasing their motivation to participate in future improvement projects (Farris et al., 2009). Kaizen events seem to have been developed by Toyota, who used them to train their suppliers in the 1970s (Sheridan, 1997). They became popular in the US in the 1990s (Schonberger, 2007). Lean Six Sigma is considered as the latest generation of improvement approaches (Snee, 2010). Six Sigma originates from Motorola Company (Antony et al., 2019). It uses statistical techniques to reduce costs and cycle times, eliminate defects, and improve customer satisfaction and profitability (Chen and Lyu, 2009). Lean Six Sigma uses tools from both Lean and Six Sigma toolboxes to obtain the better of the two approaches (Mader, 2008). As an example, DMAIIC, which is used in the present project, is a Six Sigma tool. Its different phases involve the use of specific statistical and quality tools such as the voice of customer (VOC), SIPOC (supplier,

inputs, process, output and customers), affinity diagram, Kano model, critical-to-quality (CTQ) tree, and brainstorming (Chen and Lyu, 2009). Even though in this study we combine techniques and tools coming from both Lean and Six Sigma, for the sake of simplicity we use the term “Lean” to describe our approach. For more on Lean healthcare, the reader can refer to (Costa and Godinho Filho, 2016), (Filser et al., 2017), (Hallam and Contreras, 2018), (Antony et al., 2019), and (Leite et al., 2019). For more on Kaizen event, we refer the reader to (Farris et al., 2009). For more on Lean Six Sigma, the reader can refer to (Mader, 2008), (Chen and Lyu, 2009), and (Snee, 2010).

3.2 Literature review

Frontline services are considered as the first contact point between the client and the health/social service system. Accessibility is, therefore, an important aspect of the organisation of frontline services (Lamarche *et al.*, 2003). Service accessibility issue was observed in the healthcare system in the province of Quebec in the early 2000s (Commission Clair, 2000). This problem has also been observed in other Canadian provinces as well as in other developed countries (Trottier *et al.*, 2003). In the literature, we identified three categories of works that tackled the problem of service accessibility: *Equity of access to health/social service systems* (e.g. Goddard and Smith, 2001; Oliver and Massialos, 2004; Glorioso and Subramanian, 2014), *Service accessibility for a specific population group* (Klein *et al.*, 1998; Wilson and Yoshikawa, 2007; Schapiro, 2014; Suurmond *et al.*, 2016), and *Lean use for improving service accessibility* (e.g. Mok, 2011; Atkinson and Mukaetova-Ladinska, 2012; Cheng *et al.*, 2015; Jolicoeur, 2016). The next paragraphs first provide examples of studies in the two first categories and then a systematic review of studies in the third category is presented.

Glorioso and Subramanian (2014) assessed the equity of access to the Italian public health system. They showed that frontline services were more accessible for less well-off individuals while

specialised/diagnosis/test care services were more accessible for well-off individuals. Hospitalisation service is equal. Wilson and Yoshikawa (2007) analysed the factors having an impact on the lack of service accessibility for LGB people (Lesbians, Gays, and Bisexuals) from ethnic minorities in the US. The authors proposed a number of recommendations to improve the situation such as bringing health services closer to the clients' community and improving the accessibility to services and HIV/AIDS preventive treatments. In the Netherlands, Suurmond *et al.* (2016) identified that language and communication were major obstacles for home-care service access for older adults from ethnic minorities. Schapiro (2014) and Klein *et al.* (1998) state that services ensuring confidentiality for teenagers in the US would improve accessibility and decrease risky behaviours and their consequences on physical and psychosocial health. Klein *et al.* (1998) identified that even though the majority of teenagers benefit from frontline services, most of them ignore where services ensuring confidentiality and support services dedicated to mental health, addiction and reproduction problems are offered.

Studies that reported on the use of the Lean approach mainly focussed on mental health services. LaGanga (2011) conducted a Lean project within a mental health centre organisation in the US to reduce no-shows (identified as waste in the process) and increase intake service capacity. The project focussed on the points of contact in the admission process at six clinics. The solutions developed include assigning one clinician to conduct group orientations, using qualified staff members (e.g. pre-doctoral psychology interns, clinical program managers) to handle intakes when overbooked clients show up, changing the initial orientation group schedule, from once a week to twice a week, and better welcoming the clients (e.g. developing a welcome letter, calling the clients the day before their appointment, providing transportation information and directions, etc.). The project achieved significant results in expanding access to services. Analysis of 1726 intake

appointments for the year preceding and the full year following the project led to a 27% increase in the intake capacity and a decrease of 12% in the no-shows. In British Columbia, Mok (2011) reported that within two years, the average delay for a client to have access to a psychiatrist in an outpatient psychiatry programme decreased from 13 weeks to one week by implementing Lean management principles. The authors did not provide details on how the approach was implemented. Atkinson and Mukaetova-Ladinska (2012) focussed on the problem of low referrals of clients and insufficient presence of care teams in liaison psychiatric services for older adults in the UK. Rapid progress-improvement workshops led to the identification of delay problems in the process and to the development of solutions for improving the process efficiency. One week after implementing the solutions, a permanent presence of the liaison-nurses was required due to the significant increase in the number of referred clients. Gijo and Antony (2014) focussed on the reduction of waiting time of outpatients in a super speciality hospital attached to a manufacturing company in India. The DMAIC method was used along with different techniques and tools such as SIPOC analysis, process mapping, cause and effect diagram, GEMBA, and risk analysis (Lean Six Sigma approach). The process starts from the registration of a patient up to medicine dispensing at the pharmacy. 14 steps in the process were identified as waste (e.g. wrong information entered during registration, prescription difficult to read, wrong outpatient department) and 18 potential causes were determined, of which eight causes were validated through GEMBA walks (observations during one month). Allocating junior doctors to the outpatient departments with senior doctors, having a software for real-time update of medicine inventory and printing prescriptions based on the software are examples of proposed solutions. The average waiting time was reduced from 57 minutes to 24.5 minutes. Cheng *et al.* (2015) analysed the access process to second-line mental health services in four single access points in the UK. Workshops held with employees, questionnaires, and interviews with stakeholders and the use of several Lean tools (SIPOC, value

stream mapping, root cause analysis, etc.) allowed the authors to identify that the causes of problems such as wrong references of the clients, were related to the insufficient quality/completeness of information provided by the referrers. The proposed solutions are based on the clarification and simplification of the information provided by the referrers. Telephone communication between clinicians and referrers is the preferred referral system. It would allow clinicians to instantly obtain relevant information directly from the referrers, and therefore improve the accuracy of their clinical decisions. Johannessen and Alexandersen (2018) used value stream mapping to improve accessibility for outpatients in 12 specialist clinics in Norway. They aimed at reducing waiting times (e.g. time from the reception of the referral of a new patient at a hospital to the time the patient is added to the specialist list, time from referral to treatment) and waiting lists (e.g. number of patients waiting, number of returning patients waiting for follow-up). Examples of waste sources identified are: unpredictable team communication and unclear procedures, hierarchical structures, limitation in the knowledge of front staff involved in patient treatment regarding their mutual tasks, and scarcity of regular meetings to follow-up and solve current problems. The authors focussed on improving planning (clearer outpatient booking strategy and booking horizon) in order to balance new patient treatment and waiting time reduction against delayed returning patients with significant clinical needs. Mean waiting time over all clinics decreased from 162 ± 69 days at baseline to 52 ± 10 days 6 months after the intervention. The time required to achieve the national standard average waiting time of 65 days varied from 4 to 21 months. The number of new patients waiting was reduced by 56%, and the number of delayed returning patients by 32%. In the province of Quebec (Canada), Jolicoeur (2016) conducted a Lean project within the reception, analysis, orientation and reference service of the CIUSSS de la Mauricie et du Centre du Québec to decrease the treatment delay of frontline psychosocial service requests of youths in difficulty, and improve the accessibility of these services. The project

focussed mainly on reducing the delay of the first contact in presence with the clients, reducing treatment delays of the service requests, and increasing the number of requests oriented to the right service. After implementing the solutions, an improvement of the first contact delay and a more satisfying referring mechanism were reported.

4. Methodology

The methodology followed in this study is action research (AR). AR is an empirical-based research, where the researcher is involved with members of the system being studied in a collaborative and participative process to solve a collective problem (Thiollent, 1998; Coughlan and Coughlan, 2002). AR follows a cyclical process of planning, taking action, evaluating the action, and further planning. Its outcomes are both an action and contribution to the theory (Coughlan and Coughlan, 2002). Following the distinction made by Van Aken (2004) between explanatory science and design science, AR belongs to the second category. Explanatory science mission “is a quest for truth by developing knowledge aimed at the classical triplet of description, explanation and prediction” while design science mission “is a quest for improving the human condition by developing knowledge to solve field problems, i.e. problematic situations in reality.” (Denyer et al., 2008). For design science problems, Denyer et al. (2008) discuss a design proposition called CIMO-logic, which means that in a specific class of problematic Contexts, a certain Intervention type should be used to invoke generative Mechanisms, to produce certain Outcome(s). In our study, most of our interventions followed this design proposition, which is consistent with DMAIIC framework.

In their systematic literature review, Costa and Godinho Filho (2016) identified three main research methodologies used in studies on Lean healthcare: AR (44% of 107 articles), case study (35%), and theoretical-conceptual research (18%). The authors also mentioned survey (Creswell, 1994)

and Ethnography (Hammersley and Atkinson, 2007), but these methodologies were rarely used (2% and 1% of the reviewed articles, respectively). Case study research refers to the use of multiple techniques to collect data from a number of entities by a direct observer in a single, natural setting that considers temporal and contextual aspects of the phenomenon under study, but lacks experimental controls or manipulations (Meredith, 1998). Theoretical-conceptual research is based on the theory such as conceptual discussions and literature reviews (Berto and Nakano, 2000). The study by Costa and Godinho Filho (2016) shows that theoretical-conceptual studies neither describe applied tools nor show the results. 32% of the case study-based works do not provide any result, or applied tools, while 92% of studies that use AR, systematically provide this information. This suggests that AR methodology would be more relevant for addressing Lean implementation issues which were previously identified as a limitation in the literature (see Section 1). Indeed, within AR methodology, the researcher is directly involved in the system being studied, he/she examines the situation, selects appropriate techniques and tools, applies them, and evaluates the results. As stated by Coughlan and Coughlan (2002), “action researchers are not merely observing something happening, they are actively working at making it happen.” Additionally, AR is considered as relevant to practitioners and applicable to unstructured or integrative issues (Westbrook, 1995). AR enables the researcher to have a broad view of the system and its complexity, and interact with the members of the client system (Coughlan and Coughlan, 2002). Therefore, the researcher could make continuous adjustments, design customised solution approaches and develop appropriate knowledge given the complexity of the system and changes that might occur during the study. The action is made more effective while simultaneously developing scientific knowledge (Coughlan and Coughlan, 2002).

Within this study, the researcher joined the service “Performance, Processes Improvement, and Client Trajectories” (PPICT) of the CCSMTL support program during a full-time period of six months (March 2017 to September 2017), and was directly involved in the Lean project as a member of the project team. PPICT was created in September 2015 to improve the CCSMTL’s service-programme processes by using Lean thinking. The other members of the project team were an experienced Lean agent from PPICT, the Executive Director of the Youth Programme (project promotor), and the coordinator of the local networks of children, youths and families and rehabilitation in the community (referred to as network coordinator), who assumed the role of project leader. Considering that the Youth Programme includes two territories, two service managers (SWV and JM), were involved during the project to support the project team. The promoter was responsible for putting in place success conditions. The leader was responsible for planning, executing, and monitoring the project with the support and orientations of the Lean agent and the researcher. The Lean agent and the researcher were responsible for implementing Lean thinking within the Youth Programme, collecting data, presenting the project progress to the teams, animating the Kaizen workshops, and providing support to the promoter, the leader, and the Kaizen team.

5. Lean Implementation

The project started in March 2017; data was collected from May to September 2017, and the Kaizen workshops (four successive days) took place in September 2017. As mentioned earlier, the project phases are structured following DMAIIC framework. DMAIIC process is consistent with both the cyclical process of AR methodology and CIMO-logic. Indeed, each phase of the DMAIIC requires identifying the problematic contexts, the type of interventions, mechanisms, and the intended outputs (CIMO-logic) as well as planning, taking action, evaluating the action, and (possibly)

further planning (AR process). The next paragraphs present how each phase has been implemented (interventions, i.e. techniques and tools used, results obtained, etc.) It is worth mentioning that some phases may overlap or be done simultaneously (e.g. Analyse and Innovate). Loops are also possible between the phases (AR cyclic process).

5.1 Define Phase

The goal of this phase is to define the problem, identify the project objectives and the scope. The project is documented during this phase and during all subsequent phases. An A3 sheet is used for this project. The Define phase led us to identify the project context, problem description, initial situation, and targets and objectives related to service accessibility. These aspects were presented in the Context and Problem Section. Note that, based on data collected during the Measure phase, the targets have been adjusted. Other adjustments and complementary information were added to the A3 sheet throughout the project. During the Define phase, we also performed an analysis of the stakeholders and risks with the Promoter and the Leader, which led us to identify success conditions and actions to put in place to overcome potential obstacles (the results of this analysis are confidential). Finally, a communication plan for the frontline service employees involved in the project was prepared. Inclusion and exclusion elements of the project (scope) are presented in Table 1.

[Table 1 near here]

5.2 Measure Phase

The objective of this phase is to examine the current situation more in depth based on concrete measures of the problem. To this end, the “voices” of the process, employee, and client were collected.

- **Process voice**

The process starts when a service request arrives at a reception point (e.g. a local community service centre) and ends with the end of the intervention (end of services) (Figure 1). An SIPOC process mapping was established with the Promoter, Leader, and service managers. A more detailed process map was established by the researcher and the Lean agent during their site visits in SWV and JM territories (interviews and discussions with employees involved in the process). This detailed map was crucial for understanding the process, which was complex, and identifying potential delays in the process. The map also helped in identifying differences between SWV and JM processes as well as differences between early childhood, child-youth and scholar services. One objective of the project was also to standardise SWV and JM processes where possible. A simplified process map is presented in Figure 1. This map emphasises the main steps of the process and potential delays within the processes.

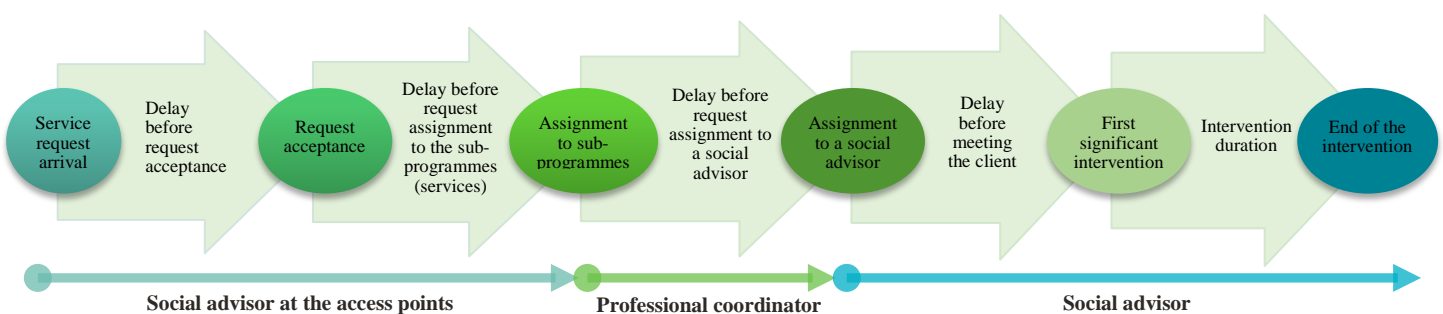


Figure 1. Main steps of a service request flow and intervention

Data on the different delays shown in Figure 1 were extracted from the information system used by the Youth Programme to monitor its performance. Table 2 presents the average delays for early childhood, child-youth and scholar services for both SWV and JM territories, from April 2016 to March 2017. We did not consider the intervention duration, which is beyond the scope of our analyses. An intervention may take several months.

[Table 2 near here]

Note that, in JM, there is a distinction in the information system between child-youth service and scholar service, which is not the case in SWV. In other words, in SWV information system, scholar service data are included in the child-youth service. For scholar service, the social advisor himself performs all steps. Table 2 shows that in SWV territory, the delay of 30 days prescribed by the MSSS is not met even before the request is assigned to a social advisor. In JM, we observe the same for child-youth service. For early childhood service, the delay between the acceptance of the request and assignment to the sub-programme is under 30 days (27 days). However, delays are observed before the first significant intervention (24 days), which leads to exceeding the prescribed delay of 30 days.

- **Employee voice**

An on-line survey was prepared for employees involved in the process described in Figure 1 in SWV and JM territories (i.e. social advisors working at the reception points, professional coordinators of early childhood, child-youth, and scholar services, and social advisors within these services). 75% of the Youth Programme employees responded to the survey. We also collected additional information through individual and group interviews with 13 employees in SWV and JM. The questions of the survey and interviews were related to employee satisfaction regarding work conditions, obstacles and issues encountered (service request reception, assignment to sub-

programmes, etc.), procedures and mechanisms used for request orientation and assignment, and potential solutions.

- **Client/referrer voice**

An online survey was also prepared for the Youth Programme clients (youths and parents of children-youths). The questions focussed on client satisfaction regarding courtesy of employees working at the reception points, quality and completeness of information requested to fill a service request, delay, perception of the delay, feedback, and issues encountered before the first significant intervention. Only six clients responded to the survey. Due to time constraints, the survey was available during a short period of summer, which is the off-peak period. This explains the low respondent rate. To complement data collected from the clients, we prepared an additional on-line survey that was addressed to the clients' referrers. This survey was similar to the client survey. 32 referrers completed the survey.

5.3 Analyse and Innovate Phases

The objective of the Analyse phase is to identify wastes in the process and the causes and root causes of the problem. These analyses are based on data collected during the Measure phase as well as the knowledge of persons participating in brainstorming workshops (a Kaizen event in our case). The Innovate phase explores potential solutions and best solutions to implement to improve the situation. Within this phase, an action plan, a change management and communication plans are also prepared for the implementation phase. Kaizen workshops are relevant for complex processes where multiple actors are involved. A Kaizen event is a workshop bringing together employees, partners, managers, and clients, all involved in the process under study, during a few consecutive days (three to five days). The participants, supported by a facilitator, brainstorm on the causes and solutions of the problem. Kaizen event seeks to rapidly identify solutions, which must

be implemented within a few weeks after the Kaizen (6 to 8 weeks). Our Kaizen team was formed of 20 participants (the researcher, the Lean agent, a support Lean agent, the Leader, two service managers, two professional coordinators, five social advisors of the Youth Programme, six social advisors and managers from partner programmes and services, and one partner-client). The Promoter is excluded from the Kaizen event. All the participants equally represented SWV and JM territories. The workshops took place during four successive days. Table 3 presents the main activities of the Kaizen during the four days.

[Table 3 near here]

The terms of the project (Define phase results) were presented to the participants by the Promoter on Day 1. The remaining activities were animated/facilitated by the researcher and Lean agent. Introduction to Lean thinking aimed at familiarising the participants with Lean principles and tools, and preparing them to use those principles and tools during brainstorming activities, processes mapping, etc. The results of Measure phase were presented to define more precisely the problem with the input of the clients/referrers and employees as well as the data extracted from the Youth Programme information system. The results of the surveys and interviews also helped feed the participants with information on potential causes and solutions during the brainstorming activities. The remaining Kaizen activities are presented in the next paragraphs.

- **Process mapping**

In order to involve the participants from the early beginning of the Kaizen and encourage project ownership and teamwork, the process was re-mapped. The process map demonstrated the complexity of the process (102 activities) and showed activities that could be simplified (13 non-value added activities). As an example, it was identified that service requests referred by one second-line service team of the Youth Programme were sent to the reception points, which perform

a new evaluation of the request before assigning it to the Youth Programme front-line services. These referred requests could be directly sent to frontline service teams without transiting through the reception points (additional delay). The process map also highlighted the differences between SWV and JM processes (18 different activities). It was obvious that the bottleneck of the process was the intervention phase, which lasts several months as mentioned before.

- **Identification of the causes and root causes**

The participants formed two sub-groups to brainstorm on the causes of the problem (i.e. brain-writing technique using post-its: one post-it, one idea). Some causes were identified in the surveys and the interviews. An Ishikawa diagram combined with affinity analysis revealed 51 causes classified into seven categories (client, process, role and responsibilities, partners, service requests, human resources, material and technology resources), each category representing a fish bone of the Ishikawa diagram. The 5 why technique was used to identify the root causes (13 in total), which are presented in Table 4.

[Table 4 near here]

- **Solution development and selection**

Again, the participants formed two sub-groups to brainstorm on the solutions (i.e. brain-writing technique). The results of the surveys and interviews were used as input as well. The teams found 91 solutions, which were classified into 13 categories (affinity analysis). Based on the multi-vote technique, 15 solutions and five recommendations (i.e. solutions beyond the scope of the project) were selected by the participants. 12 stickers were given to each participant, and the participants were asked to attach the desired number of stickers on the preferred solutions (written on post-its). The higher the number of stickers attached on a solution, the greater the importance is of the

solution. The total number of stickers on each solution was calculated, and the solutions were sorted according to the number obtained, from the largest to the smallest (Table 5).

[Table 5 near here]

- **New process mapping and performance indicators**

The participants mapped the new process with standardised activities for SWV and JM territories (one unique process for both territories). Non value-added activities were simplified or removed (where possible), and solutions related to the process (e.g. solutions 8 and 13) were highlighted on the map. Moreover, performance indicators measuring accessibility objective more precisely as well as the targets were clarified (see Table 6).

[Table 6 near here]

The target of 30 days for 75% of the clients is prescribed by the MSSS. The target of 60 days for 100% of the clients is established based on the results of client and referrer surveys, where it was reported that a delay of 60 days was acceptable for the clients.

- **Action plan and change management**

The action plan identifies the actions (solutions) to implement, the person(s) responsible for their implementation, and the timeline. Monitoring is carried out by the Leader. The action plan is usually prepared during the Kaizen and completed/refined after the Kaizen in dedicated workshops.

The participants grouped the solutions in five packages to establish the action plan:

Package 1: Set clear guidelines for the intervention (e.g. which critical information should be mentioned in the request and what the duration of an intervention should be).

Package 2: Propose a new work organisation (e.g. co-intervention and pre-intervention with a group of clients waiting for their first significant intervention).

Package 3: Clarify data monitoring (e.g. make precise the notion of significant intervention, consider group interventions as significant interventions, and implement dashboards).

Package 4: Maintain service continuum (e.g. improve collaboration when a request is transferred from one service team to another, and define transfer modalities for fully evaluated requests).

Package 5: Better inform clients and partners of the services offered (e.g. advertise offered services to other services/programmes and to community resources, continually up-date information about the services on the Intranet and the Internet).

In parallel to the five packages, other actions have been identified such as revising all cases dating back one or more years. In order to inform the Youth Programme employees, the Promoter, service managers, partners, and top managers of the CCSMTL (CEO and vice-principles) about the Kaizen event, the Kaizen participants presented their results at the end of Day 4. To ensure good change management within the Youth Programme frontline service teams, the researcher, Lean agent and the Leader presented the Kaizen results in SWV and JM territories respectively, within one month after the Kaizen. Employees who did not have a chance to take part in the Kaizen were invited to participate in post-Kaizen workshops to refine the action plan and implement the solutions.

5.4 Implement and Control Phases

The objectives of these two phases are to implement the action plan (i.e. test selected solutions via for example pilot projects), ensure change management, measure the effectiveness of the implemented solutions, and update the performance indicators. The next paragraphs give examples of implemented solutions within each action package.

- **Package 1:** Set clear guidelines for the intervention. The service request flow was clarified, an aide-memoire for the intervention was produced, a service agreement on the content of the intervention with the clients was established, and tools for case revision were developed.

- **Package 2:** Propose a new work organisation. Telephone follow-up with pending clients was implemented and interventions with group of pending clients are now offered.
- **Package 3:** Clarify data monitoring. A data input form for activity follow-up was revised and expanded, and statistical data recording of group interventions was clarified.
- **Package 4:** Maintain service continuum. The description of a service request was revised to ensure that all actors have a common understanding of a complete service request. Service requests referred by second-line service teams were revised and expanded to foster the referring process to frontline service teams.
- **Package 5:** Better inform clients and partners of the services offered. Frontline service teams now inform the reception teams on a regular basis about changes in services offered so that the clients can rapidly benefit from the new services.

In addition, the performance indicators are monitored and updated monthly. Additional indicators such as the number of pending clients reached by telephone and the average number of waiting days before the first significant intervention for clients referred by second-line service teams were also developed. These indicators are displayed on visual stations implemented in SWV and JM territories as well as in the COE decision room. Finally, it is worth mentioning that part of the solutions selected at the Kaizen event are still being implemented by the Youth programme. This is discussed in the next section.

6 Results and Discussion

This section is divided into two parts. The results and contribution to practice are presented first. The second part presents the contribution to theory and future research directions.

6.1 Results and Contribution to Practice

Six months after the Kaizen event, improvements were achieved in both SWV and JM territories. Initially, on average, 40% of the clients had their first intervention within 30 days, and 67% within 60 days. In March 2018, 53% of the clients had their first significant intervention within 30 days, and 73% within 60 days. Currently, significant improvements are being observed with the targets almost achieved. 69% of the clients have had their first significant intervention within 30 days (target: 75%), and 91% within 60 days (target: 100%). The average access delay in SWV territory is 32 days (68 days initially), and it is 25 days in JM (45 days initially). Additionally, during the financial year 2018-2019, the number of children and youths (0-18 years old) who received services has increased from 2,447 to 2,777 (13.5%) compared to 2017-2018. For the same period, the number of adult clients and parents increased from 2,300 to 2,659 (15.6%). Another significant achievement is that improving accessibility to frontline psychosocial services led to the improvement of accessibility to second-line services (Youth Protection programme). It is observed that the number of clients referred to second-line services significantly decreased. The average delay between the reception of a service request and the first intervention was reduced from 51 days (in 2016) to 30 days. It should be noted that, during the implementation phase of the project, the MSSS allocated an additional budget to the Youth Programme to hire 7.4 employees. This investment also helped in improving the access delays and motivating the teams and managers. Finally, before starting the project, the Youth Programme of the CCSMTL was ranked fourth out of the five CIUSSSs in Montreal in terms of service access delays. Now it is ranked number one in Montreal region.

From the managerial perspective, one finding was that communicating the goals and performance indicators followed by the organisation (and therefore the government) to the employees plays a

major role in increasing their awareness about the importance of those goals/indicators and their willingness to contribute to develop solutions that could improve the organisation's work and performance. In this regard, the network coordinator (project leader) stated: "Of course, some employees dislike being told about performance indicators because this puts pressure on them, but at the beginning of the project it was crucial that we promote that our main goal was to provide the best services we can to our clients. This is what kept the employees from different services mobilised." Second, the Youth Programme management reported that substantial time was required to implement all the solutions that emerged during the Kaizen event. The network coordinator claimed: "It is impossible to apply all solutions at the same time. 18 months after the kaizen event, we are still improving and applying solutions that emerged in the fall of 2017." As an example, in its effort to reduce clients' waiting time, the Youth programme is still working on improving the clinical forms used by the employees, and on facilitating the process of service request referral from the Family Medicine Group (one of the clients' referrers) to the right service, without transiting from the reception points. The implementation phase started in September 2019.

Regarding the Kaizen event, the management acknowledged the importance of the partner-client participation in the workshops. The partner-client was in turn grateful that she could participate in the project through the Kaizen event. One of her recommendations was to further involve the clients in decision-making processes and actions that affect them, and to consider the client as a full-fledged partner of the health and service system. The network coordinator who participated in the Kaizen event as the project leader declared: "In this project, the value of bringing in a partner-client was priceless. It kept the team grounded on practical solutions and quick wins. It helped in bringing "fresh" ideas from the client perspective that the team would not have thought of. Now, in the CCSMTL, we more and more invite partner-clients in these kind of projects to be sure that their

voices are heard, and their needs fulfilled.” The Child-youth and scholar service manager of SWV territory who also took part in the workshops mentioned that the Kaizen event was “a discussion table where all participants are equal and the employees’ points of view are considered and recognised by the managers. This motivated the employees to contribute to finding solutions during the workshops and implementing them after the Kaizen event.” To her, “the Kaizen event is a driving force that gathered together the employees and the managers. Two years later, the Kaizen solutions are still supported by the employees.”

6.2 Contribution to the Theory and Research Perspectives

From the discussion above and further analyses, we identified 10 success factors of Lean (and Kaizen event) implementation and sustainability that we compared to success factors previously identified in the literature. We found seven success factors common to those reported in the literature: top management commitment, leadership, employee engagement, staff empowerment, multidisciplinary team, communication, and customer focus. Top management is the organisational part that directs the organisation’s efforts to accomplish its goals, fulfil its mission, and achieve its vision (Parkhi et al., 2019). Sreedharan et al. (2018) stated that top management commitment is the most crucial factor for success and without this factor, it would be difficult to implement any improvement methodology. In the CCSMTL, Lean is a culture change that occurred recently in the organisation, and which is supported by the CEO and promoted by the MSSS (government). As an example, in our project, at the end of Day 4 of the Kaizen event, the CCSMTL’s CEO and other top managers attended the presentation of the Kaizen results performed by the Kaizen participants. Leadership is another crucial factor that significantly contributed to the success of the project. The Executive Director of the Youth Programme who had the role of project promoter in our study was highly involved in the project from the beginning. She participated in the main steps of the project

(except the Kaizen event), and provided support to the project team. As an example, she contributed to the analysis of stakeholders and risks inherent to the project, and took actions to overcome what was identified as potential obstacles during the analysis. Additionally, during the project, the initial project leader quit the organisation, but this did not affect the project progress as the Executive Director rapidly nominated one of the two service managers as a substitute before the arrival of the new project leader.

Employee engagement is the attitude of employees through which they demonstrate their pride and satisfaction in being part of the organisation. This attitude is very beneficial for organisations since employees are working not only to achieve personal objectives but also for the success of the organisation in general (Zepeda-Lugo et al., 2018). This attitude was observed during the employee interviews in SWV and JM territories, in the employee survey as well as during the Kaizen event. As an example, engagement was cited as one of the top three strengths of the teams in the survey. The concept of empowerment consists in delegating authority to subordinate employees. This means that employees do not have to consult with the manager to make a decision and must accept responsibility for the consequences of the decision (Pradhan et al., 2014). In our study, professional autonomy and management support were cited among the strengths of the teams in the employee survey. It was also observed during the Kaizen event that employees were comfortable expressing their ideas in front of the managers.

The advantage of forming a multidisciplinary team is the fact that each member contributes with knowledge and skills derived from their profession while at the same time complementing the others (Zepeda-Lugo et al., 2018). This was observed during the Kaizen event. The team was composed of 20 participants having different backgrounds (social workers, psycho-educators, managers, clients, etc.) and coming from different services (reception points, early childhood,

child-youth, and scholar services, second-line services, mental health, etc.) and two territories (SWV and JM). This helped in solution brainstorming and process harmonisation and standardisation. In this regard, the Child-youth and scholar service manager of SWV territory stated that the project significantly contributed to bringing together employees from JM and SWV territories, which led them to adopt a common vision and implement common practices. Another interesting aspect is the fact that the Lean agent and the researcher have different backgrounds. The Lean agent has experience in Lean management and social work, and knows the organisation well, while the researcher has background in industrial engineering and was external to the organisation. For instance, the experience of the Lean agent helped in obtaining the adherence of the participants and facilitated the presentation of the results while the knowledge of the researcher helped in structuring the project and deepening data collection and analysis.

Communication was important for disseminating the goals of the organisation, motivating managers and employees, creating a good work climate and reducing resistance to change. In our study, as mentioned earlier, communicating the organisation's goals and performance indicators to the employees helped in increasing their awareness about the importance of performance management and their willingness to contribute to developing solutions. A communication plan was prepared at the beginning of the project to ensure that all employees were informed about the project. As an example, two presentations were performed by the Lean agent and the researcher in SWV and JM (respectively) in front of the employees to provide information about the goal of the project, its execution, Lean thinking, and to address the questions and concerns of the employees. Similar presentations were performed after the Kaizen event to disseminate the results of the workshop, obtain the adherence of employees who did not participate in the Kaizen and prevent resistance to change.

Customer focus is a main pillar of Lean thinking. In our study, focussing on the client was crucial for motivating the employees and identifying relevant solutions and performance targets. For example, the client and referrer surveys clarified what was perceived as acceptable delays and helped the project team to set relevant targets for service access delays that are consistent with the governmental prescriptions and the clients' viewpoint. The participation of a partner-client in the Kaizen event also contributed to creating success conditions for efficiently brainstorming on the causes of the problem and developing solutions that are centred on the clients.

We identified three additional success factors specific to our study. First, a four-day Kaizen workshop was a new practice in the CCSMTL where typically, only three days are dedicated to a Kaizen event. Allocating four days for the Kaizen allowed the participants to efficiently carry out the steps of problem solving despite the complexity of the process. The four-day Kaizen event helped the participants to focus on the problem without feeling rushed by the Kaizen agenda. Second, we found that the clarity of the project goal was crucial for motivating the employees and the Kaizen participants. From the beginning of the project (and the Kaizen event), the focus was on the problem of accessibility to services. It was continuously recalled by the managers that the problem was not about the quality of services. This contributed to create a good working environment and helped the employees to focus on the "true" problem. We also found that disseminating quantitative measures of the problem (accessibility delays) to the employees and partners during the Kaizen event increased their awareness of the problem and motivated them to work as a team to find solutions to address the situation. The Child-youth and scholar service manager of SWV territory stated: "now the employees do not only see numbers, they are aware of what is behind the numbers".

In this study, we followed AR methodology, which allowed us to adapt Lean tools and techniques according to the complexity of the system, the results of actions put in place, and changes that occurred during the study. As an example, following the examination of the results of the client survey, we prepared another survey for the referrers to compensate for the low respondent rate of clients. It is reported in the literature that the success of Lean implementation is also context dependent. In other words, Lean implementation needs to be adapted to the situation being observed to increase the chances of success (Leite et al., 2019). We believe that AR is an appropriate research methodology for achieving this goal. Additionally, the DMAIIC process that we followed in the study to structure our project is consistent with both the cyclical process of AR methodology and CIMO-logic.

During this study, we also met some challenges. First, the process under study was complex, and at the beginning of the project, it was difficult to delineate the extent of the process. In particular, including the clinical intervention part was challenging because of the complexity of making observations or measuring such activities which last several months and which are specific to each employee and each client. We decided to include the clinical part as a macro-activity in the whole process to allow the employees and managers to include this important part (bottleneck) in the thinking process. By doing this, we reassured the employees that our goal was not to standardise clinical activities (value added activities) that remain individualised, but to standardise and simplify non-value added activities (e.g. information sharing and communication processes). Another challenging aspect was the Lean vocabulary used to communicate and share information with managers, employees, and clients. Some employees suggested that the vocabulary (e.g. the terms “optimisation” and “performance”) should be adapted to healthcare to obtain more adherence from employees to Lean projects. One employee claimed: “we are not working with machines, we deal

with human suffering”. Even though four days were allocated to the Kaizen event, working with a group of 20 participants was complex. The researcher and the Lean agent had to adapt the group-working techniques to facilitate the brainstorming process and data collection from the participants. In particular, many solutions emerged during the Kaizen. Sorting the solutions (e.g. affinity analysis) and ranking them was a challenge as well. As mentioned before, due to the large number of solutions that emerged, it was difficult to efficiently schedule the implementation of all solutions after the Kaizen event.

Future research developments should focus on designing efficient Kaizen events for dealing with large groups that are inevitable when the process is complex and involves many departments/services and partners. In particular, advanced and efficient methods for sorting the solutions and ranking them should be developed to support the Kaizen participants in selecting the preferred solutions. On the other hand, more effort should be put into scheduling of solution implementation after the Kaizen event. Finally, Lean vocabulary should be adapted to healthcare to increase employee adherence to Lean projects and enhance the chances of success.

7 Conclusion

This study focusses on a large and complex healthcare system providing frontline psychosocial services to youths in difficulty and their family at seven facilities located in two distinct territories in Montreal region. The goal was to reduce accessibility delays to the services to ensure that the needs of the clients are satisfied at the right time, avoid a worsening of their situation, and reduce the number of clients referred to second-line services. More precisely, the objective of the management was to allow 75% of the clients to obtain their first significant intervention within 30 days and 100% within 60 days. We used the Lean approach within action research methodology to conduct this project. This study describes in detail all steps of the project, the Lean tools/techniques

used and the results obtained at each step during the project as well as the results obtained 18 months after the implementation of the solutions. Before implementing the solutions, 40% of the clients had their first intervention within 30 days, and 67% within 60 days. 69% of the clients have now had their first significant intervention within 30 days, and 91% within 60 days. Improving accessibility to frontline services also led to improving accessibility to second-line services. This study contributes to both practice and the theory. We identified 10 success factors such as top management commitment, leadership, employee engagement, staff empowerment, multidisciplinary team, communication, and customer focus as well as five challenges (process complexity, Kaizen team size, Lean vocabulary, solution election, and completion time for implementing the solutions). This work provides a model for researchers and practitioners to build their own roadmap to address complex issues in healthcare such as accessibility to services, and to improve their client care experience.

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Tables

Table 1. Project scope

Inclusions	Exclusions
Service request sorting at the reception points	Software changes
Waiting list management (unassigned service requests)	Solutions requiring budgetary development or structure changes
Record-keeping procedures and forms	IT equipment changes
Roles and responsibilities	Physical locations and staffing plans
Co-intervention and group intervention	Professional practice standards
Work organisation	Case revision lessening

Table 2. Average delays in the process

Territories	Sub-programmes (i.e., services)	Average delays to complete the process steps (Figure 1) (in days) for 100% of the clients				Total average delays (in days) for 100% of the clients
		Request acceptance	Assignment to sub-programmes	Assignment to a social advisor	First significant intervention	
SVW	Early childhood	12	24	15	21	72
	Child-youth and scholar	11	28	14	21	73
JM	Early childhood	3	36	15	15	69
	Child-youth	3	24	12	12	50
	Scholar	2	13	9	0	24

Table 3. Kaizen main activities

Day 1	Day 2	Day 3	Day 4
Presentation of the project term (Promoter)	Identification of wastes from the process map	New process mapping	Action plan completion
Introduction to Lean thinking	Brainstorm on the causes and root causes	Identification of performance indicators	Discussion of the change management plan
Presentation of collected data	Brainstorm on the solutions	Preparing the action plan	Presentation of the Kaizen results
Process mapping	Selection of solutions to implement and recommendations		

Table 4. Root causes

1. Inappropriate information systems for data input and unclear guides for data input	7. Poor communication and some partners/clients do not well understand the services offered
2. Changes that occurred in the healthcare system lead to difficult collaborations	8. Unequal request volumes (high volume at the reception points and peaks during the year)
3. Unclear intervention guides (priorisation, intensity, assessment, reports, etc.)	9. Multiple requirements to consider (professional orders, clients' needs, etc.)

4. Invisible work and preventive interventions are not recognised	10. Over-quality: “we want a perfect request with expanded information”
5. The clients have complex problems	11. Insufficient staff and difficulty to substitute departing employees
6. Expanded territories	12. Work in silos
13. Overload work and performance requirements	

Table 5. Selected solutions

1. Set clear guidelines for the intervention (duration and number of meetings)	8. Standardise SWV and JM practices
2. Reduce administrative tasks	9. Clarify the procedure of data input in the information system (‘statistics’ input)
3. De-compartmentalise the work of teams/social advisors	10. Monitor the data more precisely
4. Benefit from appropriate tools to foster the request/client evaluation	11. Create short-term and mid-term intervention cells
5. Standardise record keeping procedures (reduce drafting)	12. Increase the number of case revisions
6. Facilitate/promote intervention plan use	13. Identify critical information to be mentioned in the request
7. Consider pre-intervention with a group of clients waiting for their first significant intervention	14. Transfer service requests from second-line teams directly to frontline teams without transiting through the reception points

15. Implement a mechanism to up-date the services offered and to facilitate communication among service teams

Table 6. Performance indicators and targets

Indicators	Initial situation	Targets
1. % clients who have received their first significant intervention within 30 days (SWV and JM territories)	40%	75%
1. % clients who have received their first significant intervention within 60 days (SWV and JM territories)	67%	100%
3. Average delay before the first significant intervention (in days) (SWV and JM territories)	57	30