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Implementing multiple intervention strategies in Dutch public health-related policy networks

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Summary

Improving public health requires multiple intervention strategies. Implementing such an intervention mix is supposed to require a multisectoral policy network. As evidence to support this assumption is scarce, we examined under which conditions public health-related policy networks were able to implement an intervention mix. Data were collected (2009–14) from 29 Dutch public health policy networks. Surveys were used to identify the number of policy sectors, participation of actors, level of trust, networking by the project leader, and intervention strategies implemented. Conditions sufficient for an intervention mix (≥3 of 4 non-educational strategies present) were determined in a fuzzy-set qualitative comparative analysis. A multisectoral policy network (≥7 of 14 sectors present) was neither a necessary nor a sufficient condition. In multisectoral networks, additionally required was either the active participation of network actors (≥50% actively involved) or active networking by the project leader (≥monthly contacts with network actors). In policy networks that included few sectors, a high level of trust (positive perceptions of each other's intentions) was needed—in the absence though of any of the other conditions. If the network actors were also actively involved, an extra requirement was active networking by the project leader. We conclude that the multisectoral composition of policy networks can contribute to the implementation of a variety of intervention strategies, but not without additional efforts. However, policy networks that include only few sectors are also able to implement an intervention mix. Here, trust seems to be the most important condition.

Key words: health public policy, intersectoral partnerships, implementation, intervention, programme evaluation

INTRODUCTION

Background

To effectively promote health, an integrated public health policy is strongly recommended (Smedley and Syme, 2000; Kickbusch and Gleicher, 2012). Such a policy is needed because of the intrinsic complexity of health and health behaviours, i.e. both are influenced by personal and environmental determinants (Swinburn *et al.*, 1999; Krieger, 2001). Personal determinants include an individual's motivation and capability to perform health behaviours,

whereas environmental determinants refer to opportunities to perform these behaviours (Michie *et al.*, 2011). Therefore, interventions to promote health behaviour should preferably target both kinds of determinants (Bartholomew *et al.*, 2011). Personal determinants may be effectively influenced by health education strategies, while changing the environment, in terms of physical (e.g. housing), social (e.g. community networks), economic (e.g. employment) or political determinants (e.g. smoking bans), generally requires other strategies, such as regulation, facilitation, case finding and/or citizen participation (De Leeuw, 2007; Bartholomew *et al.*, 2011; De Leeuw *et al.*, 2014). Therefore, interventions (or packages of interventions) targeting both kinds of determinants should include multiple intervention strategies (Jackson *et al.*, 2007). Such integrated interventions are also called an 'intervention mix'.

Such an intervention mix is assumed to require the involvement of different policy sectors and actors within those sectors (Krieger, 2001; Kickbusch and Gleicher, 2012). Although health education strategies are largely under the control of the health sector itself (Kickbusch and Gleicher, 2012; McQueen *et al.*, 2012), non-educational strategies are generally controlled by other policy sectors (Kickbusch and Gleicher, 2012; McQueen *et al.*, 2012). Therefore, the development and implementation of an intervention mix usually take place in multisectoral policy networks (Provan and Milward, 1995; Booher and Innes, 2002). Although multisectoral networks are considered an appropriate response to health challenges (Kickbusch and Gleicher, 2012), there is not much evidence for this presumption (Breton and De Leeuw, 2011; Hayes *et al.*, 2012). Moreover, the public administration literature identifies at least three other conditions that may be of importance for network performance: (i) the active involvement of network actors, (ii) trust among network actors and (iii) active networking by a project leader (Bryson *et al.*, 2006; Klijn and Koppenjan, 2016). Although these conditions have been recognized in the public health literature as well (Zakocs and Edwards, 2006; Aarts *et al.*, 2011; Carey *et al.*, 2014), we still need to better understand the factors affecting the capacity to promote health (Roussos and Fawcett, 2000; Carey *et al.*, 2014).

Study aim

The aim of the present study was to strengthen the evidence for an integrated public health policy by answering two research questions: (i) Is a multisectoral policy network indeed necessary for the implementation of an intervention mix that includes multiple intervention strategies; (ii) Which other conditions or combinations of conditions are necessary for a multisectoral policy network to achieve this kind of network performance?

Theoretical framework

(a) In multisectoral policy networks, policy development and implementation are dependent on the deployment of various actors' resources. This means that the *active participation* of these actors is an essential pre-condition (Kickert *et al.*, 1997; Gage and Mandell, 1990; Milward and Provan, 2000; Lewis, 2000). However, more active involvement of network actors also increases network complexity, which in turn may impede network performance (Klijn and Koppenjan, 2016). Hence, we expect that active participation is particularly beneficial for the implementation of an intervention mix in combination with conditions that mitigate complexity, such as trust and active networking (Klijn and Koppenjan, 2016). This is further explained in Sections (b) and (c).

(b) In policy networks, interdependent but autonomous actors have to work together. As these actors have their own interests and strategies, which may be unconnected or conflicting, *trust* may enhance both the development and implementation of innovative policies (Sako, 1998; Provan *et al.*, 2009; Klijn *et al.*, 2010). Trust, meaning that actors have positive perceptions of the intentions of other actors (Klijn *et al.*, 2010), is expected to reduce complexity and improve network performance because (Rousseau *et al.*, 1998; Sako, 1998; Klijn *et al.*, 2010): (i) actors are more inclined to take other actor's interests into account; (ii) actors will invest more in stable relations without the need for complex contracts to tame opportunistic behaviour and (iii) actors are more willing to share information and to participate in innovation. Because of its importance for innovative policy solutions, we expect trust to contribute to the implementation of an intervention mix.

(c) Since governance processes in multisectoral networks are complex, outcomes are not easily achieved without active managerial effort (McGuire and Agranoff, 2011; Klijn and Koppenjan, 2016). The actors have different (sectoral) values and interests that may hinder the achievement of integrated public health policy approaches. *Active networking by a project leader* is identified as one of the essential conditions to achieve success (Kickert *et al.*, 1997; Provan and Kenis, 2008; Klijn *et al.*, 2010; McGuire and Agranoff, 2011). It facilitates coordination and information sharing, and mitigates conflicts and non-cooperation (McGuire and Agranoff, 2011; Klijn and Koppenjan, 2016). Managerial networking, in terms of network managers having extensive contacts with other actors, is also positively related to network

performance (Meier and O'Toole, 2003; Akkerman and Torenvlied, 2013). Therefore, we expect that active networking by the project leader will be positively related to implementing an intervention mix—in particular if multiple sectors are included in the network.

Policy context

The present study was performed in the context of the *Gezonde Slagkracht* (Decisive Action for Health) programme. This programme (2009–15), initiated by the Dutch Ministry of Health, Welfare and Sport, provided support for municipalities or alliances of municipalities (further referred to as 'projects') to build multisectoral policy networks to develop and implement integrated policies on overweight, alcohol and drug abuse and/or smoking (ZonMw, 2009). Financial support depended on the level of experience with integrated policy, and ranged from 75 000 to 250 000 euro for a period between 2 and 5 years. Professional support included workshops on national regulations affecting public health policy, interactive policy development, implementing evidence-based interventions and policy continuation.

METHOD

Qualitative comparative analysis

Our theoretical framework indicates that it is the combination of conditions that is important for network performance, rather than the influence of conditions separately. Therefore, we performed a fuzzy set qualitative comparative analysis (fsQCA): a qualitative, set-theoretical method to comparatively analyse medium-n cases (Ragin, 2008; Schneider and Wagemann, 2012). In fsQCA, cases are understood as configurations of conditions (here: multisectoral network, active participation of network actors, trust among network actors and active networking by the project leader) that produce a certain outcome of interest (here: network performance in terms of an intervention mix). Relationships between conditions and the outcome are expressed in terms of necessity and sufficiency, which are identified by comparatively analysing the cases.

Design

Our observational cross-sectional study included the 34 local public health networks within the *Gezonde Slagkracht* programme.

Data collection

Data were collected through three surveys. A further specification of the measurement of conditions is presented in Supplementary Appendix S1.

Conditions

In a first web-based survey, the *multisectoral network* composition was assessed by asking project leaders (completed by $n = 38$; 100% response) who they kept in touch with in the context of the *Gezonde Slagkracht* programme. Actors were assigned to sectors by one researcher DP and a research assistant using a framework that included 14 sectors that are commonly identified as potential participants in Dutch municipal policy processes (Goumans, 1997). In the same survey, the level of *active networking* was assessed by asking project leaders to indicate their average contact frequency with each of the actors involved in each of the individual networks (Akkerman and Torenvlied, 2013). In a second web-based survey, we assessed the level of *active participation* by asking the network actors (completed by $n = 240$; 49% response) to indicate their level of involvement in the project (Edelenbos *et al.*, 2010). In the same survey, we measured *trust* by asking project leaders and network actors how they perceived the intentions of the other actors (Klijn *et al.*, 2010).

Performance

A third paper-and-pencil survey assessed the interventions that were implemented by the networks. For that, we asked the principle implementer of each individual intervention to report its aims and components (completed by $n = 158$; 81% response). Two researchers KG and PvA used this information to categorize the intervention strategies (Bartholomew *et al.*, 2011; De Leeuw, 2007) into health education (e.g. school learning module), regulation (e.g. legislation on the sale of alcohol products in sport cafeterias during youth activities), facilitation (environmental or organizational changes e.g. new playground, supply of sports activities or materials), citizen participation (e.g. organization of a walking session) and case finding [e.g. health (behaviour) screening activities].

Cases

For 29 of the 34 projects that participated in the *Gezonde Slagkracht* programme we obtained all data needed to include them in the fsQCA (Table 1; Supplementary Appendix S2). These projects addressed either overweight ($n = 16$), or alcohol and drug abuse ($n = 11$), or a combination of these and other behavioural risk factors ($n = 2$). On average, the policy networks included 20.5 actors, who represented 5.72 different sectors. Of the network actors, on average 38% reported to be actively involved. The level of trust among project partners was perceived to be positive (mean score 0.82),

Table 1: Overview of projects included, scores on conditions and outcome, and fsQCA solution terms

		Conditions									Outcome			Solutions from fsQCA			
Project	Theme	N Actors	N Sectors	*N* sectors (calibrated)[1]	Contact frequency	Contact frequency (calibrated)[2]	% Actors actively involved	% Actors actively involved (calibrated)[3]	Trust	Trust (calibrated)[4]	*N* Interven-tions	*N* Non-educational Strategies	*N* Non-educational Strategies (calibrated)[5]	Solution I-a	Solution II-a	Solution III-a	Solution IV-a
AD	2	13	7	0.67	2.92	0.67	31	0.00	0.92	0.67	5	3.00	0.67	X			
AF	1	19	8	0.67	3.04	0.67	10	0.00	0.48	0.00	1	3.00	0.67	X			
AO	1	37	12	1.00	2.23	0.00	71	1.00	0.83	0.67	11	4.00	1.00		X		
AP	2	39	10	1.00	2.60	0.33	57	1.00	0.74	0.33	5	3.00	0.67		X		
BH	2	30	5	0.33	2.97	0.67	56	1.00	0.90	0.67	16	4.00	1.00			X	
AI	2	79	5	0.33	3.62	1.00	58	1.00	1.03	1.00	30	3.00	0.67			X	
AW	2	15	6	0.33	3.54	1.00	56	1.00	0.84	0.67	11	3.00	0.67			X	
BC	1	9	5	0.33	4.11	1.00	63	1.00	1.48	1.00	13	3.00	0.67			X	
AH	1	6	3	0.00	2.80	0.67	67	1.00	0.80	0.67	6	2.00	0.33			X	
AG	2	9	3	0.00	2.64	0.33	25	0.00	0.90	0.67	5	4.00	1.00				X
AN	1	14	5	0.33	2.70	0.33	38	0.00	0.80	0.67	3	3.00	0.67				X
BD	2	26	2	0.00	2.62	0.33	36	0.00	0.81	0.67	2	3.00	0.67				X
AE	1	3	2	0.00	2.50	0.33	33	0.00	0.80	0.67	7	1.00	0.00				X
AA	1	11	6	0.33	3.20	0.67	20	0.00	0.96	0.67	19	4.00	1.00				
AV	3	49	7	0.67	2.44	0.33	36	0.00	0.96	0.67	10	4.00	1.00				
AX	1	10	5	0.33	2.78	0.67	0	0.00	0.83	0.67	6	4.00	1.00				
BB	1	18	7	0.67	2.50	0.33	22	0.00	0.47	0.00	15	4.00	1.00				
AY	1	15	8	0.67	2.07	0.00	33	0.00	0.57	0.33	6	3.00	0.67				
AZ	2	6	3	0.00	3.83	1.00	33	0.00	0.87	0.67	11	3.00	0.67				
AM	1	25	10	1.00	3.05	0.67	57	1.00	0.57	0.33	6	2.00	0.33				
AS	1	26	7	0.67	2.81	0.67	60	1.00	1.19	1.00	19	2.00	0.33				
AQ	3	29	8	0.67	2.29	0.00	36	0.00	0.62	0.33	23	2.00	0.33				
AR	1	25	9	1.00	2.48	0.33	20	0.00	1.28	1.00	3	2.00	0.33				
BA	1	7	2	0.00	3.33	0.67	0	0.00	0.90	0.67	5	2.00	0.33				
BE	1	2	2	0.00	3.00	0.67	0	0.00	1.00	1.00	1	2.00	0.33				
AC	1	6	3	0.00	3.00	0.67	40	0.00	0.76	0.33	2	1.00	0.00				
AL	2	11	3	0.00	2.50	0.33	60	1.00	0.72	0.33	2	1.00	0.00				
AK	2	7	3	0.00	3.43	0.67	50	1.00	0.20	0.00	3	0.00	0.00				
AU	2	48	10	1.00	1.57	0.00	36	0.00	0.62	0.33	4	0.00	0.00				
M		20.48	5.72	0.41	2.85	0.52	38	0.38	0.82	0.58	8.62	2.59	0.55				
SD		17.15	2.86	0.38	0.54	0.30	20	0.49	0.25	0.30	7.22	1.18	0.35				

See Supplementary Appendix S2 for a full overview of network composition and outcome.

Conditions and outcome in fsQCA.

1 = multisectoral network; 2 = active networking project leader; 3 = active participation network actors; 4 = trust within the network; 5 = intervention mix.

Solutions from fsQCA.

(Capitals mean that condition is present; lower cast means that condition is absent).

Solution I-a MULTISECTORAL NETWORK*ACTIVE NETWORKING*active participation.

Solution II-a MULTISECTORAL NETWORK*active networking*ACTIVE PARTICIPATION.

Solution III-a multisectoral network*ACTIVE NETWORKING*ACTIVE PARTICIPATION*TRUST.

Solution IV-a multisectoral network*active networking*active participation*TRUST.

and project leaders had about monthly contact with the network actors (mean score 2.85). The projects managed to implement on average 8.62 interventions, which covered 2.59 different types of intervention strategies.

Analysis step 1: calibration

The first step in the fsQCA procedure is to construct a data matrix in which the cases (here: the 29 public health policy projects) are transformed into configurations of conditions (here: a multisectoral network, the active participation of network actors, trust among network actors, and active networking by the project leader) and the outcome of interest (here: an intervention mix). Conditions and outcomes are conceptualized as sets wherein the cases have membership between 0 (fully out the set; condition/outcome is not present) and 1 (fully in the set; condition/outcome is present). This involves calibration: transforming the raw data by assigning set membership to cases by using theoretical and empirical information (Schneider and Wagemann, 2012). To support the calibration we additionally used cluster analysis (for an explanation and justification of this procedure see Supplementary Appendix S1) (Ragin, 2008). The calibration resulted in the following categorization (Table 1). A network was considered multisectoral if $\geq$7 of the 14 possible sectors were present (12 projects). Actor participation was considered active if $\geq$50% of the network actors was actively involved (11 projects). Trust was regarded present if actors held on average positive perceptions of each other's intentions (19 projects). Networking by the project leader was considered active if the average contact frequency was less than equal to monthly (16 projects). Interventions were regarded as comprising multiple intervention strategies if $\geq$3 of the 4 non-educational strategies were implemented (17 projects).

Analysis steps 2 and 3: truth table construction

Before constructing the truth table, we assessed whether each individual condition was necessary or sufficient for the outcome. As none of the conditions passed the applicable thresholds (necessity $\geq$0.90; sufficiency $\geq$0.75) (Schneider and Wagemann, 2012), they were all included in the second and third steps of the analysis, i.e. the construction of the truth table (Schneider and Wagemann, 2012). As these steps included four conditions (with 1/0 membership), cases could be distributed over 16 logically possible configurations (i.e. 2^4). After distributing the 29 cases in this study (Step 2), 14 of these configurations appeared to be empirically present (Table 2). Next, we assigned the outcome (i.e. the presence or absence of an intervention mix) to each of the empirical configurations in the truth table (Step 3). Assigning the presence of the outcome to a configuration implies its sufficiency to achieving an intervention mix. To this purpose, we used two consistency measures to set a cut-off point: raw consistency ($\geq$0.80), and proportional reduction in inconsistency consistency ($\geq$0.70) (Schneider and Wagemann, 2012). In doing so, we excluded those configurations that could also be considered sufficient for the absence of the outcome, i.e. configuration no. 7 (Rihoux and Ragin, 2009; Schneider and Wagemann, 2012).

In the truth table (Table 2), the first six rows present configurations of conditions that were assigned the outcome. These rows cover 13 of the 29 cases, including 2 cases that are logically contradictory as they did not show the outcome in our study (AH and AE). The latter eight rows present configurations that were assigned the non-outcome; these rows cover the 16 remaining cases.

Analysis step 4: truth table analysis

Step 4 concerns the truth table analysis. This involves the pairwise comparison of the configurations that are deemed sufficient for the outcome, in order to find those conditions that are irrelevant for producing the outcome, thereby identifying the conditions or combination(s) of conditions that do explain the implementation of an intervention mix. The guiding principle in this pairwise comparison is to express the same logical statements (i.e. the truth table rows) in a more parsimonious manner (Schneider and Wagemann, 2012). Two measures were used to interpret the truth table solution: consistency and coverage (Ragin, 2006). Consistency assesses how closely a sufficient relationship is approximated (i.e. the degree to which the empirical data are in line with the postulated relation); coverage shows how meaningful this relationship is empirically (i.e. how many cases are covered by the relationship).

Steps 2–4 of the analysis were performed with QCA software (Ragin and Davey, 2014). The cluster analyses were performed with Tosmana software (Cronqvist, 2011).

RESULTS

The fsQCA resulted in four solutions, i.e. configurations of conditions sufficient for the implementation of an intervention mix (Table 3a) In multisectoral networks, an additional requirement was either active networking by the project leader in the absence of active involvement of network actors (Solution I-a), or active involvement

Table 2: Truth table with conditions for implementing an intervention mix

		Conditions				Outcome			
Configu -ration No.	*N* cases covered	*N* sectors (calibrated)	Contract frequency (calibrated)	Active participation of network actors (calibrated)	Trust (calibrated)	*N* non-educational strategies (calibrated)	Raw consistency[a]	PRI consistency[a]	Cases covered[b]
1	1	1	0	1	0	1	1.000	1.000	AP
2	1	1	0	1	1	1	1.000	1.000	AO
3	1	1	1	0	0	1	1.000	1.000	AF
4	1	1	1	0	1	1	1.000	1.000	AD
5	5	0	1	1	1	1	0.832	0.716	AH, AI, AW, BC, BH
6	4	0	0	0	1	1	0.823	0.701	AE, AG, AN, BD
7	2	1	0	0	1	0	0.816	0.665	AR, AV
8	4	1	0	0	0	0	0.783	0.664	AU, AY, AQ, BB
9	5	0	1	0	1	0	0.763	0.636	AA, AX, AZ, BA, BE
10	1	0	1	0	0	0	0.784	0.623	AC
11	1	1	1	1	0	0	0.795	0.493	AM
12	1	1	1	1	1	0	0.872	0.493	AS
13	1	0	0	1	0	0	0.398	0.248	AL
14	1	0	1	1	0	0	0.497	0.248	AK

[a]A raw consistency value of 1.0 indicates that all the cases covered by a configuration have the outcome; lower scores indicate that at least part of the covered cases do not have the outcome. A low PRI consistency score indicates that one or more cases covered by a configuration have roughly identical consistency scores for both the presence and absence of the outcome, irrespective of the raw consistency scores. As the cut-off point for assigning the presence of the outcome, we used a PRI consistency score of ≥0.70 and a raw consistency score of ≥0.80 (Schneider and Wagemann, 2012).

[b]Cases that are underlined did not implement an intervention mix. Within a configuration, when some cases show the outcome, while others do not, this is called a logical contradiction. We tried to resolve logical contradictions as much as possible, especially by recalibrating some of the conditions (e.g. active participation of network actors), provided that either theoretical and empirical information or cluster analyses sufficiently supported this (Rihoux and Ragin, 2009; Schneider and Wagemann, 2012).

Table 3: Complex solution of truth table

Solution No.	Conditions				Outcome	Statistics			Projects (alphabetical order)
	Multisectoral network	Active participation of network actors	Trust within network	Active networking by project leader	Intervention mix including multiple intervention strategies	Raw coverage	Unique coverage	Consistency	
(a) Conditions sufficient for implementing an intervention mix									
I-a	+	−		+	+	0.21	0.10	1.00	AD, AF
II-a	+	+		−	+	0.17	0.12	1.00	AO, AP
III-a	−	+	+	+	+	0.21	0.17	0.83	AH, AI, AW, BC, BH,
IV-a	−	−	+	−	+	0.29	0.19	0.82	AE, AG, AN, BD
Solution coverage			0.73						
Solution consistency			0.87						
Cases that are underlined did not implement an intervention mix; therefore they are logically contradictory cases									
(b) Conditions sufficient for NOT implementing an intervention mix									
I-b	–		–	+	–	0.36	0.23	0.70	AC, AK
II-b	–	+	–		–	0.18	0.05	0.88	AK, AL
III-b	+	+		+	–	0.20	0.18	0.89	AM, AS
Solution coverage			0.59						
Solution consistency			0.79						

+: condition or outcome is present.
−: condition or outcome is absent.

of the network actors in the absence of active networking by the project leader (Solution II-a). In policy networks that were not multisectoral, trust between network actors was required (Solution III-a and IV-a). In the absence of both multiple sectors, active participation of network actors, and active networking by the project leader, trust was necessary for achieving an intervention mix (Solution IV-a). If the network actors were actively involved, then, besides trust, active networking by the project leader was also required (Solution III-a). The consistency scores for the truth table solution as well as for the individual solutions were well above the lowest permitted threshold of 0.75, while the solution coverage can be regarded as more than acceptable (Ragin, 2009).

DISCUSSION

This comparative case study examined (i) Whether a multisectoral policy network is necessary for the implementation of an intervention mix and (ii) Which other conditions or combinations of conditions are necessary for a multisectoral policy network to achieve this kind of network performance. To answer these questions we performed an fsQCA.

Methodological considerations

One advantage of an fsQCA is its ability to improve our understanding of integrated public health policy at an intermediate level (Ragin, 2008), providing opportunities to connect in-depth knowledge from single or small-scale case studies with the aggregated knowledge from large-N case studies (Sabatier, 2007). However, due to the many choices in an fsQCA, the robustness of its results can be questioned. One way of checking robustness is to change the operationalizations of the conditions and the outcome (Skaaning, 2011). Due to the multiform conceptualization of integrated public health policy (Tubbing *et al.*, 2015), our operationalization of a multisectoral network can be criticised for not taking into account the number of actors, as network size may contribute to the implementation of a greater variety of intervention strategies, independent from the presence of different sectors. A similar criticism applies to the operationalization of intervention mix. Therefore, we examined the effect of a different operationalization of both these conditions, in which we additionally took into account network size and intervention package volume. Although partly covering different projects, this alternative fsQCA resulted in an almost similar solutions pattern (not shown here). Our interpretation of this similarity is that the results of the present fsQCA are robust, but that the size of the network and the volume of the intervention package should be taken into account when interpreting the results. The same applies to two other potential influential factors not included in our fsQCA: the kinds of sectors in the network (Zakocs and Edwards, 2006), and the budget available for establishing integrated public health policy (Rousseau *et al.*, 1998). After all, the number of conditions that can be included in an fsQCA is limited (Rihoux and Ragin, 2009), although a preceding comparative analysis to select those conditions that are most likely to influence the presence or the absence of the outcomes could provide a solution here (Lucidarme *et al.*, 2016).

Interpretation

The results from our fsQCA imply first of all that, in contrast with our premise, a multisectoral network was not a necessary condition for the implementation of an intervention mix. In networks that incorporated only a few different sectors, either the presence of trust alone (Solution IV-a) or a combination of trust, active participation of network actors, and active networking by the project leader (Solution III-a) contributed to the implementation of an intervention mix. Here, trust seemed to play its predicted role of enhancing network performance (Provan *et al.*, 2009; Klijn *et al.*, 2010). In the absence of multiple sectors, however, trust may have been important to reduce transaction costs and information sharing (Lane and Bachman, 1998; Klijn *et al.*, 2010) rather than, as we expected, to handle conflicting between-sector interests (Sako, 1998; Provan *et al.*, 2009). Trust may also have prevented conflicts due to different financial interests of the actors in the network (Sako, 1998). Moreover, trust may have convinced network actors to invest additional budget to collectively purchase interventions from outside the network, or persuaded them to ask actors that are inside their network—but outside the network of the project leader—to support the implementation of a variety of intervention strategies. However, the similarity of interventions included in the intervention packages of projects covered by Solution III-a indicates that the presence of trust may also have reduced within-sector competition between service providers. Still, for projects covered by both Solutions III-a and IV-a, network size and/or intervention package volume also may have contributed to the implementation of an intervention mix.

In the two other solutions, a multisectoral network was indeed part of the sufficient combination of conditions. However, the implementation of an intervention

mix also needed either active networking by the project leader or the active participation of network actors. Solution I-a confirms our expectation that networks including multiple sectors require active managerial effort to reach outcomes (Klijn *et al.*, 2010; McGuire and Agranoff, 2011). Solution II-a supports our assumption that network performance requires the active participation of network actors as each actor is dependent on the employment of resources of other actors (Klijn and Koppenjan, 2016). Interestingly, Solutions I-a and II-a indicate the interchangeability of two conditions: if active participation of network actors was present, active networking by the project leader needed to be absent, and *vice versa*. Contrary to our expectation, the presence of both seems to impede rather than enhance the implementation of an intervention mix. This suggestion was confirmed in an additional fsQCA (see Table 3b) in which the absence of an intervention mix served as the outcome of interest. There, one of the sufficient combination of conditions (Solution III-b) was the presence of both a multisectoral network, active participation of network actors, and active networking by the project leader. Apparently, in such networks, the presence of too much managerial activity increases rather than reduces complexity. Moreover, the other two solutions in the truth table (Solutions I-b and II-b) confirm the importance of the presence of either a multisectoral network (as seen in Solutions I-a and II-a) or trust (as seen in Solutions III-a and IV-a).

On the whole, the importance of managerial effort was weaker than expected. This is probably due to our choice to operationalize this condition as networking (Akkerman and Torenvlied, 2013), i.e. the number of contacts. Yet, having many contacts does not necessarily reflect performing network management strategies (Klijn *et al.*, 2010)—it may also include doing the wrong things leading to conflicts. As in previous studies on multisectoral policy networks, network management strategies, such as connecting actors and exploring content, indeed proved to be important for network performance, future studies should consider a content-wise operationalization of network management.

CONCLUSION

A multisectoral composition of public health-related policy networks can contribute to the implementation of a variety of intervention strategies, but not without additional efforts, such as active management by a project leader or the active involvement of network actors. However, networks that include only few sectors are also able to implement an intervention mix. Here, trust seems to be the most important condition. The variety in the combination of conditions sufficient for the implementation of an intervention mix supports the recent finding that the configuration of conditions needed to achieve network performance may vary according to the local situation (Lucidarme *et al.*, 2016). This also implies that the specific combination of favourable conditions we found in our study may not be generalizable to policy networks in other countries or that address other health-related themes. Our findings are also in line with a recent meta-synthesis which concludes that multisectoral policy initiatives require a well-thought-out infrastructure to support policy implementation (Carey *et al.*, 2014). In order to facilitate their performance, multisectoral public health-related policy networks should be based on both the purpose and the context of the policy (Carey *et al.*, 2014). This requires sufficient understanding of content-related policy theories as well as process-oriented theories of the policy process (Breton and De Leeuw, 2011). With our study as an example, one way forward may be further research at the interface between the scientific domains of public administration and public health.

ETHICAL APPROVAL

According to provisions of the Dutch Medical Research Involving Human Subjects Act (WMO), this study did not require approval from a medical research ethics committee.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

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