

### **Abstract**

While theory on team membership is emerging, limited empirical attention has been paid to the effects of different types of team membership on outcomes. We propose that an important but overlooked distinction is that between membership of real teams and membership of co-acting groups, with the former being characterized by members who report that their teams have shared objectives, structural interdependence and engage in team reflexivity. We hypothesize that real team membership will be associated with more positive individual and organizational level outcomes. These predictions were tested in the English National Health Service, using data from 62,733 respondents from 147 acute hospitals. The results revealed that individuals reporting the characteristics of real team membership, in comparison to those reporting the characteristics of co-acting group membership, witnessed fewer errors and incidents, experienced fewer work related injuries and illness, were less likely to be victims of violence and harassment, and were less likely to intend to leave their current employment. At the organizational level, hospitals with higher proportions of staff reporting the characteristics of real team membership had lower levels of patient mortality and sickness absence. The results suggest the need to clearly delineate real team membership in order to advance scientific understanding of the processes and outcomes of organizational teamwork.

*Keywords:* real team membership, co-acting group membership, teamwork, healthcare management, patient mortality, sickness absence

## **24-Karat or Fools Gold? Consequences of Real Team and Co-acting Group Membership in Healthcare Organizations**

The social impulse for individuals to work together towards the achievement of a common goal is rooted in our evolution (Deci & Ryan, 2000). Given the associated social, economic and survival benefits, seeking membership of structured stable groups has been a fundamental and consistent human behavior over thousands of years (Axelrod & Hamilton, 1981; Bowlby, 1969). This manifests in a powerful need to belong, establish and sustain social relationships, and build our identity through membership of groups, motivating us to exert effort on behalf of the group to achieve collective goals (Baumeister & Leary, 1995; Tajfel & Turner, 1986).<sup>1</sup> It is therefore understandable that organizations have replicated this natural form by adopting team-based structures as a strategy for successful management and operational effectiveness (Hackman, 1986). Indeed, rapid technological innovations, coupled with the increased complexity and dynamism of task environments have prompted a trend towards flattened multi-team systems (Marks, DeChurch, Mathieu, Panzer, & Alonso, 2005). Such systems are predicated on the intuitive premise that team-based organizations can learn quickly, accomplish efficiently and adapt effectively, enabling them to thrive in challenging contexts (Mohrman, Cohen, & Mohrman, 1995).

Individuals who work in teams report greater well-being than those who do not (Carter & West, 1999). In a survey of Canadian employees, Godard (2001) found significant associations between team working and the individual outcomes of job satisfaction, empowerment, commitment, citizenship behavior, task involvement and sense of belongingness. A number of other studies have also linked the job characteristics associated with working in a team to significant improvements in organizational commitment and job

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<sup>1</sup> We use the term group to refer to a psychological group. That is “*one that is psychologically significant for the members, to which they relate themselves subjectively for social comparison and the acquisition of norms and values, ... that they privately accept membership in, and which influences their attitudes and behavior*” (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987, pp. 1-2). We return to the definitional issues surrounding the term ‘team’ later in the paper.

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satisfaction (Batt, 2004; Elmuti, 1997). Furthermore, organizations which are structured in teams have relatively low levels of employee turnover (Glassop, 2002) and absenteeism (Cohen, Ledford, & Spreitzer, 1996), pointing to the psychological benefits of team membership. What of the organizational consequences? In a meta-analysis of 131 field studies on organizational change, Macy and Izumi (1993) found that interventions with the largest effects upon financial measures of organizational performance were team development interventions and the creation of autonomous work groups. Similarly, in a review of twelve large-scale surveys and 185 case studies of managerial practices, Applebaum and Batt (1994) concluded that team-based working led to improvements in organizational performance in terms of both efficiency and quality. A more recent meta-analysis of 61 independent samples (Richter, Dawson, & West, 2011) found that team working had a significant though small positive relationship with both employee attitudes and performance outcomes. Overall, evidence for effects at the organizational level remains limited.

As a result both of its intuitive evolutionary value and reported strategic advantages, the team concept has a strong appeal in organizations, and managers generously assign the 'team' label to a variety of collectives of individuals and groups (Saltman et al., 2007; Sennett, 1998). This has been termed by some 'the romance of teams' (Allen & Hecht, 2004) implying that managers and researchers assume that the simple presence of entities with the name 'team', regardless of structure and function, is a sufficient ingredient for improved performance and organizational effectiveness. Learmonth (2009) also argues that academics adopt the term 'team' liberally and indiscriminately, with the result that research findings on the effects of team working are frequently inconsistent. Indeed, there have been calls in the recent literature to tighten up our definitions of team and team membership in order to reinforce conceptual integrity and help move the science forward (Hollenbeck, Beersma, &

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Schouten, 2012; Mortensen, 2014; Tannenbaum, Mathieu, Salas, & Cohen, 2012a). As we explore in this paper, real teams are more than simply a collective of individuals (Hackman, 2002, 2012; Wageman, 2001; West & Lyubovnikova, 2012). Based on existing definitions of real teams, we build on the work of Hackman (2002; 2012) and West (2012), to identify three important characteristics which collectively capture real team membership, allowing for comparisons to be drawn between the effects of real team membership ('24 karat') and co-acting group membership ('fool's gold') on a range of individual and organizational outcomes. In doing so, we advance emerging conceptions of team membership, by examining specific characteristics of team membership which have important implications for members of those teams and the organizations in which they exist. Indeed, although theory and research on the construct of team membership is beginning to emerge (Mortensen, 2014; O'Leary, Mortensen & Woolley, 2011), limited empirical attention has been paid to the effects of different types of team membership on outcomes. Further, with the exception of just a handful of studies that have compared the performance of real teams and co-acting groups (Hackman & O'Conner, 2005; Wageman, 2001), the differential effects of membership on these different types of collective requires closer attention, particularly when the teams we see in contemporary organizations are undergoing significant change in structure, function and form (Tannenbaum et al., 2012a; Wageman, Gardner, & Mortensen, 2012). Overall, we seek to address two key questions: what are the consequences for individuals of real team and co-acting group membership and what are the consequences for organizations of varying proportions of staff reporting membership of such collectives?

### **Defining Real Team Membership and Co-acting Group Membership**

According to O'Leary et al., (2011), '*individuals are members of a team when they share the responsibility and reward (or penalty) for the outcomes of the team's work and recognize each other as members of the team*' (pp. 463-64). This conceptualization provides

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an important foundation for articulating what is meant by *real team membership*, and how this differs from *co-acting group membership*; two constructs which underpin the study presented here. Based on existing theory, we first begin by examining the defining characteristics of real teams and co-acting groups, before delineating these constructs at the level of team membership.

A widely cited definition of ‘team’ is that of Salas, Dickinson, Converse, and Tannenbaum (1992) who argue that a team as ‘*a distinguishable set of two or more people who interact, dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission*’ (p. 4). Based on the seminal work of Alderfer (1977) and Hackman (1987), Guzzo and Dickson (1996) similarly define teams as social entities that are interdependent because of the tasks they perform (pp. 308-09). They argue that while the terms ‘group’ and ‘team’ are often used interchangeably, there are degrees of difference between such collectives (also see Hollenbeck et al., 1995; Kozlowski & Bell, 2003). Indeed, employees often report that they are part of a team when they are merely working in close proximity to other people, or have the same supervisor. Hackman (2002) argues that such individuals are not members of real teams as their task does not require them to work collectively and interdependently with others towards a common goal (Paris, Salas, & Cannon-Bowers, 2000; Wageman et al., 2012). Such collectives have previously been identified as ‘pseudo teams’ (e.g., Katzenbach & Smith, 1998; West, 2012) or ‘co-acting groups’ (e.g., Hackman, 2002; Schnake, 1991). Real teams, on the other hand, ‘*are intact social systems whose members work together to achieve a common purpose. They have clear boundaries that distinguish members from non-members. They work interdependently to generate a product for which members have collective, rather than individual, accountability. And they have at least moderate stability, which gives members time to learn how to work well together*’ (Hackman, 2012; p.437). Based on this, and other widely cited

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conceptualizations of ‘team’ (e.g. Cohen & Bailey, 1997; Kozlowski & Ilgen, 2006; Salas, Rosen & King, 2007; Sundstrom, De Meuse, & Futrell, 1990), we propose that an individual holds *real team membership* when they not only identify themselves as being a member of a team, but a) they report that their team’s task requires them to work closely and interdependently with fellow team members, b) they report that their team has shared objectives, and c) they report that their team engages in regular reflexivity to review team effectiveness. In turn, following O’Leary et al.’s (2011) description of team membership, an individual holds co-acting group membership when they identify themselves as being a member of a team, but do not report interdependent working, shared objectives, or reflexivity. Such individuals are therefore more likely to work in parallel to their co-workers, often doing similar sorts of work but in a more discrete and independent manner, whereby each worker is held accountable for his/her personal output (Hackman & O’Conner, 2005).

A common feature of both real team and co-acting group membership is that individuals label themselves as team members – a concept referred to as *identified team membership* (Mortensen, 2014). An individual’s perception as a member of a group represents an important component of their self-identity, constituting a significant source of self-esteem and directly influencing behavior and attitudes (Tajfel & Turner, 1986). According to social identity theory, ‘*social identity is the cognitive mechanism which makes group behaviour possible*’ (Turner, 1982; p. 21), reinforcing group boundaries and triggering processes of social categorization. Indeed, the concept of boundedness is widely regarded as an important and defining characteristic of teams (e.g., Alderfer, 1977; Guzzo & Dickson, 1996; Hackman, 2002; 2012; McGrath, Arrow, & Berdahl, 2000), enabling team members to be reliably distinguished from non-members. However, it could be argued that the concept of identified team membership is equally as relevant for defining co-acting groups. Thus it is necessary to identify further attributes that differentiate real team from co-acting group

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membership. Based on existing theorizing, we propose that the following three characteristics enable this delineation.

**Structural interdependence.** The definitions of ‘team’ presented above suggest that interdependence is a crucial underlying characteristic of real teams (e.g., DeChurch & Mesmer-Magnus, 2010; Fiedler, 1966; Hackman & Katz, 2010; Ilgen, Hollenbeck, Johnson, & Jundt, 2005; Kozlowski & Bell, 2003). Indeed, many have argued that the very essence of a team is the interdependence between its members (Deutsch, 1949; McGrath, et al., 2000; Wageman, 1995). Interdependence captures the degree to which goals, tasks and outcomes determine the collective relationship between team members (Barrick, Bradley, Kristof-Brown, & Colbert, 2007; Campion, Medsker, & Higgs, 1993; Stewart & Barrick, 2000). Wageman et al. (2012) distinguish structural interdependence (i.e. when the task structure, including the distribution of resources and the definition of the task, creates an imperative for interdependent working) from behavioral interdependence (i.e. when group members decide to work together interdependently regardless of the collaborative requirements of the task). While the former type of interdependence necessitates the use of teamwork (Hackman, 2002), Wageman et al. (2012) argue that the latter should not be used to define whether a particular collaboration is a real team (p.307), given that behavioral interdependence occurs when individuals choose to work collaboratively even when there is no structural imperative to do so. Further, the extent of structural interdependence increases when tasks themselves become more difficult (Van der Vegt, Emans, & Van de Vliert, 2001), for example when the task moves from being pooled to sequential, or sequential to reciprocal in nature. When structural interdependence is low, the need for team members to interact in order to attain their goals is also low; consequently, teamwork behaviors are required to a lesser extent (Rousseau, Aubé, & Savoie, 2006). Conversely, when structural interdependence is high, the teams work must

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be arranged so that members' co-ordinate their efforts, interact frequently and closely, and exchange resources in order to accomplish their task (Wageman et al., 2012).

Thus, a key sub-dimension of real team membership is structural interdependence, whereby team members report having to co-ordinate their work interdependently in order to accomplish the team's task. Conversely, co-acting group membership is characterized by the absence of structural interdependence, whereby members report that there is no need to work closely and co-ordinate team member efforts.

**Shared objectives.** Implicit in the presence of structural interdependence is that team members are working together towards the achievement of a common purpose or shared goal (Wageman et al., 2012). Just as individual goals can promote task strategies that optimize individual performance (Locke & Latham, 1990), clearly specified group-level goals set the standards of the effectiveness of the team and facilitate the development of cooperative strategies and transactive memory (Gully, Incalcaterra, Joshi, & Beaubien, 2002; Kleingeld, van Mierlo, & Arends, 2011). Indeed, Shea and Guzzo (1987) found that in clearly defining team goals, members were more able to recognize their interdependence. Thus, consistent with existing definitions which imply that teams are goal-orientated (e.g. Kozlowski & Ilgen, 2006; McGrath et al., 2000; Salas et al., 2007; Salas, Sims, & Burke, 2005; Wageman, Hackman, & Lehman, 2005), our conceptualization of real team membership captures those who report that their teams have shared objectives. Conversely, co-acting group membership is characterized by the absence of a common purpose, whereby members report that there are no shared objectives in their team. Shared objectives is therefore the second key sub-dimension of real team membership.

**Reflexivity.** Thus far, the conceptualization of real team membership presented here has closely mirrored the characteristics captured in previous definitions of real teams, namely Hackman (2002; 2012). The third defining characteristic of real team membership is not only



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related to existing definitions, but also reflects the increasing consensus that teams are adaptive self-regulating entities (Kozlowski & Ilgen, 2006). Indeed, Hackman (2002; 2012) posits that real teams are those which learn how to work well together. In order to recognize the purpose of the team (shared objectives) and through what means this can be achieved (structural interdependence), team members must engage in team regulatory processes in order to develop transactive memory systems related to performance effectiveness. Similarly, socio-technical systems theory (Cummings, 1978) suggests that the primary mechanism through which group task design influences outcomes is team self-regulation (Cohen, 1993). The theory implies that real team members reflect upon and discuss the effectiveness of their current work routines and how they could be improved – a process widely referred to as reflexivity (Bray, Andersson, & Lantz, 2009; West, 2000). Furthermore, Hollenbeck et al. (1995) also note that *'Groups [...] are best characterized as teams, rather than as sets of independent decision makers, for several reasons. First, these individuals are highly interdependent. Each is dependent on others for important information related to the team's success. Second, the members have a common goal and a common fate. The team's success or failure directly affects the individuals' own outcomes. Third, members of the team influence each other in the course of making a decision.'* (p. 293). Thus, not only are the previous sub-dimensions of interdependence and shared objectives self-evident in this definition, but we also inferred reflexivity as a third characteristic, given that this is the very process that enables team members to reach participative decisions over objectives and self-regulate task processes (De Dreu, 2002).

Reflexivity enables team members to collectively plan ahead, actively structure situations, and ensure that the team stays on track towards its objectives (Carter & West, 1998; De Dreu, 2007; Kozlowski, Gully, McHugh, Salas, & Cannon-Bowers, 1996). Thus, real team membership implies that an individual reports that their team engages in regular

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reflexivity, enabling the collective sense-making of interdependent tasks, team objectives, and understanding of the requirements for team effectiveness. These reflections serve as motivational triggers for defining future collective behavior, and determine how team objectives will be adapted to reflect current and anticipated circumstances. The processes of reflecting on objectives and monitoring progress therefore facilitates team adaptation, forming the basis for learning and performance in complex interdependent tasks (Gurtner, Tschan, Semmer, & Nägele, 2007; West, 1996, 2000). Conversely, co-acting group membership is characterized by the absence of team reflexivity, whereby members report that their team does not reflect on team effectiveness or how it could be improved. Although co-acting group members may meet occasionally in order to share information, this exchange will largely be through habit, obligation or a simple desire for interpersonal interaction, rather than because there is an imperative for collective performance (West & Lyubovnikova, 2012). Reflexivity is thus the third key sub-dimension of real team membership.

Overall, we identify three important team characteristics; structural interdependence, shared objectives and reflexivity, to collectively define real team membership. While real team membership captures individuals who report that their teams have these three characteristics, co-acting membership is defined as identified membership of a working group that takes a superficial 'team' form, whereby members may believe they work in a team, but in reality report working in ways that are inconsistent with the basic notion of teamwork. On the other hand, the collective sub-dimensions of real team membership mean that team members are involved in the development of shared mental models regarding the team's objectives, facilitating interdependent action and collective adaptability; defining activities of real teams. Structural interdependence, shared objectives, and reflexivity can thus be seen as symbiotic, whereby interdependence is articulated and reinforced via shared objectives (Shea & Guzzo, 1987), which in turn remain appropriate and relevant to team performance

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requirements via reflexivity (Edmondson, 1996). In turn, reflexivity enables team members to adapt their activities according to the structural imperatives required by the dynamic task environment (West, 2000). Theory would thus suggest that real team membership will have synergistic effects over and beyond the impact of any one of its three sub-dimensions in isolation, or indeed co-acting group membership, characterized by the absence of one, two, or all three sub-dimensions.

### **Consequences of Real Team and Co-Acting Group Membership**

So what are the consequences of real team and co-acting group membership?

According to Hackman's model of team effectiveness (Hackman, 1987, 2002; Wageman et al., 2005), team effectiveness is partly contingent on whether the individuals responsible for the work are a real team, rather than a co-acting group. Previous research conducted on 64 analytic teams in the United States intelligence community supports this model, demonstrating that real teams perform better than co-acting groups (Hackman & O'Conner, 2005). In a mixed-method field study of 34 teams, Wageman (2001) also found that team design features, which included whether teams could be described as real teams or co-acting groups, had a powerful effect on team self-management and team performance, over and beyond that of leader coaching. These findings highlight the fundamental importance of team design according to the real team characteristics outlined above.

Thus, while a handful of studies have established the effects of real teams over co-acting groups at the group level of analysis, no research has empirically examined the effects of real team and co-acting group membership at the individual and organizational level. This is surprising given the emergence of multi-level theory (Kozlowski & Klein, 2000) and the recognition that teams are best understood as '*complex adaptive systems in dynamic interaction with the smaller systems (i.e., the members) embedded within them and the larger systems (e.g., organizations) within which they are embedded*' (McGrath, 1997, p. 18).

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Indeed, DeChurch and Zaccaro (2010) argue that a multi-level perspective is necessary if we are to better understand the effects that team-based working has in multi-team systems.

Consistent with this perspective, and building on emerging ideas on team membership, we propose to focus on two levels of analysis that have been neglected to date. In the following sections we draw upon relevant theory to delineate a number of specific hypotheses examining the effects of real team and co-acting group membership on individual and organizational outcomes. In doing so we focus on the particular organizational context of healthcare, in which the notion of team-based working is not only strongly embedded in policy (Care Quality Commission, 2010; Institute of Medicine, 2001; Joint Commission, 2012) but also highly prevalent in practice (e.g., Fay, Borrill, Amir, Haward, & West, 2006). However, the nature of team membership varies widely across this sector, given the difficulties of achieving real team membership in organizations that are characterized by overlapping priorities, distracted attention and limited resources (Dixon-Woods et al., 2014); meaning that co-acting group membership is increasingly rife.

**Individual outcomes.** How might real team and co-acting group membership have differential effects on the outcomes of individuals who report these alternative types of membership? Below, we consider four highly relevant health and safety related outcomes in the context of healthcare; witnessed errors and incidents, work-related injuries and illness, violence and harassment, and turnover intentions.

The context in which healthcare team members operate is characterized by particularly high levels of stress, complexity and workload, and the stakes for errors are high (Salas et al., 2007). In the United States, three to four percent of those hospitalized are harmed by the care they receive, with 44,000-98,000 deaths attributed annually to preventable medical errors (Kohn, Corrigan, & Donaldson, 1999). In a recent study of preventable adverse events, Zegers et al. (2009) asked trained doctors and nurses to review

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7926 hospital admissions of deceased and discharged patients in a random sample of 21 hospitals in the Netherlands. They report 5.7% of all admissions included at least one adverse event (AEs) which compared to 2.9% to 16.6% in other studies of AEs in other comparable Westernized countries. Among deceased patients, the authors found that 10.7% of patients had experienced an AE, of which 5.2% were deemed avoidable. They also calculated that preventable AEs contributed to the death of 4.1% deceased patients. Extrapolated to a national level, Zegers et al. (2009) estimate 1735 (CI: 1482 to 2032) avoidable deaths occurred in Dutch hospitals in 2004. Similar findings were also reported in an English sample by Hogan et al. (2012) where 5.2% of reviewed deaths had a 50% or greater chance of being preventable. Again the authors extrapolated this figure to a national level, and report an estimate of 11,859 preventable hospital deaths (CI: 8712 to 14,983) occurred in English hospitals in 2009. The principle problems associated with preventable deaths were highlighted as including poor clinical monitoring and diagnostic errors. Collectively these studies highlight that many people lose their lives due to preventable medical errors every year.

However, research posits that effective teamwork is associated with improved patient safety and reduced medical errors (Baker, Day, & Salas, 2006; Heinemann & Zeiss, 2002; Manser, 2009). More specifically, theory would suggest that the structure of real teams creates conditions that mitigate poor performance, meaning that individuals with real team membership are less likely to witness errors and incidents taking place in their immediate team environment. Indeed, structural interdependence ensures that team members work in a coordinated manner and understand how their work patterns and resources are interrelated. This imperative for interdependent working means that team members communicate frequently, become familiar working together, come to anticipate each other's responses and needs, and can thus provide compensatory behaviors (Alonso et al., 2006; Hackman, 1993).

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Indeed, previous research has shown that interdependence and interaction are associated with reduced team errors (Foushee, Lauber, Baetge, & Acomb, 1986). Interdependence has also been linked to team members compensating for one another in times of fatigue or absence (Porter, Gogus, & Yu, 2010). This mutual performance monitoring and backup behavior which stems from structural interdependence thus reduces the risk of errors and incidents occurring in the surrounding team environment (Helmreich, Foushee, Benson, & Russini, 1986; McIntyre & Salas, 1995).

Furthermore, when an individual reports the characteristics of real team membership (i.e. interdependence, shared objectives, and reflexivity) this also suggests that he/she is working towards the same shared objectives as fellow team members (such as prioritizing patient safety), rather than pursuing potentially non-complementary goals (such as one team member seeking speed of throughput while others are pursuing high quality care). In the context of healthcare, this shared understanding fosters team member actions that are congruent with collective goals, thus reducing the likelihood that errors will occur in the proximal team environment (Alonso et al., 2006). The reflexivity also evident in real team membership means that if an error/incident does occur, team members take time to reflect on performance, adapt their processes, and re-allocate resources accordingly in order to reduce the likelihood of such occurrences in the future (Edmondson, 1999). Indeed, self-regulatory behaviors enable team members to learn from their mistakes and prevent errors via anticipatory responses, leading to an ultimate reduction in medical errors (Cordery, Wright, & Wall, 1997; Hackman, 1986). Although reflexivity might encourage those with real team membership to more readily report errors that they witness in their team (Edmondson, 1999), the overall safer task environment afforded by such membership means that the relative number of errors that take place in their team in the first place is likely to be lower. Furthermore, in contexts where inter-team working is highly prevalent, such as healthcare,

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real team membership will not only facilitate reflection and action on adapting internal team processes and objectives, but also upon how the team interacts with other teams in the wider organizational environment, thus building an inter-team climate for safety related behaviors, such as error detection and correction.

On the other hand, co-acting group membership, with the associated lack of structural interdependence, means that members will perceive themselves as working independently with more distinct discrete roles, and will thus lack an understanding about how their task contributions and work-flow patterns might be interrelated. Such individuals are more likely to duplicate work unnecessarily, are less able to understand and adapt to the needs of fellow teammates, and are also less likely to support and backup teammates due to a perceived lack of interdependence. Further, lack of shared objectives will be associated with a higher likelihood of confusion over the focus of collective efforts or even competing efforts. Indeed, co-acting group members may anticipate that other 'team' members will take responsibility for particular tasks but, due to a lack of shared objectives, priorities are not well understood or agreed upon; thus creating a team environment that is more prone to errors. Finally, the associated absence of reflexivity that characterizes co-acting group membership means that collective learning is severely inhibited, and thus errors are more likely to occur in the surrounding team environment (Lyubovnikova & West, 2013). Indeed, in a study of 193 critical prescribing incidents, over one third could be attributed to poor team functioning, such as failing to challenge poor practice or question other team members' actions or decisions (Lewis & Tully, 2009). Based on the theorizing above, and the collective power of the three real team membership dimensions, we propose therefore propose the following hypotheses:

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*H1: Individuals who report real team membership will report witnessing relatively low levels of errors and incidents that could harm patients or staff in their immediate work environment in comparison to those who do not work in teams.*

And the corollary:

*H2: Individuals who report co-acting group membership will report witnessing relatively high levels of errors and incidents that could harm patients or staff in their immediate work environment in comparison to those who do not work in teams.*

Given that the witnessing of errors and incidents are likely to be closely related to experiences of stress and illness, and potential injury to those involved, many of the arguments outlined above apply also to the outcome of work related injuries and illness. In health services, injuries to staff are common, with 14% of NHS staff reporting suffering from work related injuries or illness in 2009 (Care Quality Commission, 2010). However, the characteristics afforded by real team membership will jointly enable teams to develop practices, work patterns and safeguards that mitigate such events from whatever source they arise, meaning that such individuals operate in safer work environments, in which their team is less prone to error. Indeed, it has been found that teams which reinforce safe practice through shared objectives are less likely to expose individual members to hazardous processes affecting their health and well-being (McKee et al., 2010). Furthermore, real team members collectively spend time reviewing their past performance, assess the potential risks of doing things differently, and adapt their shared objectives and task activities accordingly, thus operating as self-correcting performance units (Hackman, 1993). This leaves members less vulnerable to experiencing an injury during the execution of team tasks. Research also shows that membership of teams which show clarity in team and individual goals, meet regularly, and recognize diverse skills of their members, is associated with reduced stress among health care team members (Carter & West, 1999). In another study of 400 health care



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teams, better team functioning (defined as teams with clear objectives, and high levels of participation, support for innovation, and an emphasis on quality) was positively associated with team member mental health (Borrill, West, Shapiro, & Rees, 2000). Thus, real team membership, we suggest, involves creating and maintaining a safer environment through shared responsibility for team members' and non-team members' safety, thus leaving such individuals less susceptible to work-related stress and illness. Conversely, members of co-acting groups are more likely to experience higher levels of work related injuries and illness in an inherently hazardous environment such as healthcare. Indeed, poor team working has been associated with increased sickness absence amongst doctors (Kivimäki et al., 2001).

Hence our third and fourth hypotheses:

*H3: Individuals who report real team membership will report experiencing relatively low levels of work related injuries and illness in comparison to those who do not work in teams.*

And the corollary:

*H4: Individuals who report co-acting group membership will report experiencing relatively high levels of work related injuries and illness in comparison to those who do not work in teams.*

Experiences of violence and harassment are not uncommon in the healthcare sector. In a study of 3,465 emergency nurses, 25% reported experiencing physical violence more than 20 times in the previous three years (Gacki-Smith et al., 2009). However, as with the previous outcomes above, we argue that real team membership can mitigate experiences of violence and harassment in the immediate team environment. Indeed, research would suggest that clearly stipulated team objectives, role clarity, effective coordination, and supportive relationships mean that team members are more likely to work together in a collaborative and cooperative manner and thus less likely to engage in harassment, bullying or abuse of fellow team members (Carter & West, 1999; Mickan & Rodger, 2005). Structural interdependence,

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shared objectives and opportunities for learning via reflexivity are thus likely to create positive group norms for potency, cohesiveness and calm, making it less likely that aggression by patients and others will be provoked (Agervold, 2009). Real team membership will also afford closer and sustained contact with fellow team members, ensuring that they are perceived as part of a collective and therefore less prone to attack from others.

Conversely, co-acting group membership may create conditions of intragroup conflict and competitive interdependence (Deutsch, 1949) whereby members of the same team may pursue non-complementary or even opposing goals. Furthermore, under conditions of co-acting group membership, team members may misinterpret each other's roles, contributions or actions, potentially resulting in frustrations, conflicts and disputes (Salin, 2003). Such negative interpersonal interactions and associated emotions can communicate themselves to others (Walter & Bruch, 2008), manifesting in incidents of violence, harassment or abuse (Leymann, 1996). Moreover, the relative isolation of co-acting group members (compared to those with real team membership who share a common goal with their teammates) means that they can more easily be subject to abuse by patients, their relatives and other members of the public (Hayes & Bonnet, 2010). Indeed, Martin and Daffern (2006) found that a team approach was fundamental to manage patient aggression and maintain perceptions of personal safety amongst mental health clinicians. Further, poor team communication, an unsafe team approach, and a lack of team support were all factors that reduced staff confidence in managing aggressive patients. Hence are third and fourth hypotheses:

*H5: Individuals who report real team membership will report experiencing relatively low levels of violence and harassment at work in comparison to those who do not work in teams.*

And the corollary:

*H6: Individuals who report co-acting membership will report experiencing relatively high levels of violence and harassment at work in comparison to those who do not work in teams.*

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Finally, we hypothesize that real team membership will be negatively associated with turnover intentions, whereas the opposite will be true for co-acting team membership. Meta-analyses have identified the key predictors of turnover including job satisfaction, organizational commitment, organizational attachment and withdrawal cognitions (Griffeth, Hom & Gaertner, 2000; Riketta & Van Dick, 2005). We propose that an employee who has co-acting group membership will have a relatively impoverished experience of 'team' work. As a result they are likely to be dissatisfied because of the unfulfilled expectations of being part of a supportive interdependent team, and will therefore have stronger intentions to quit. Moreover, such individuals are more likely to be vulnerable to work stressors, errors, accidents and aggression in the workplace, and consequently, are more likely to leave their team; a proposition that is supported by previous research (e.g., Hetlevik & Hunskår, 2004; Kaarna, 2004; Sibbald, Bojke, & Gravelle, 2003). Conversely, teams which afford real team membership are more likely to achieve their intended effects and to meet the expectations of their members, thus providing a more fulfilling work environment offering safety, support and success. Indeed, research points to these conclusions in that members of effective teams do report higher job satisfaction, role clarity and well-being (Mickan & Rodger, 2005) and lower levels of stress (Buttigieg, West, & Dawson, 2011). We therefore hypothesize that:

*H7: Individuals who report real team membership will report relatively low levels of turnover intentions in comparison to those who do not work in teams.*

And the corollary:

*H8: Individuals who report co-acting group membership will report relatively high levels of turnover intentions in comparison to those who do not work in teams.*

The proposed hypotheses thus far suggest that real team membership has common and beneficial effects on various health and safety related outcomes that individuals witness and experience in the workplace as well as attitudinal outcomes related to intention to leave as a

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result of the structural characteristics of their immediate work group. In summary, the dimensions of real team membership are hypothesized to jointly enable the development of collective practices, work patterns and safeguards that mitigate such negative events (errors and incidents), experiences (injuries, illness, violence and harassment) and attitudes (intention to leave).

**Organizational outcomes.** Based on the increasing need to examine the nested complexity of real organizational life (Kozlowski & Klein, 2000), different types of team membership evident in health care organizations are not only likely to influence individuals but also important macro-level outcomes, such as aggregate levels quality of care, effective use of resources, staff turnover and hospital financial performance (West, Dawson, Admasachew, & Topakas, 2011). Indeed, previous research has shown team-based working to be associated with improved efficiency, reduced hospitalization, and reduced costs (e.g., Ross, Rink, & Furne, 2000; Sommers, Marton, Barbaccia, & Randolph, 2000). We propose that significant differences in two critical organizational outcomes, patient mortality and sickness absence, are dependent upon the proportions of staff who report the characteristics of real team and co-acting group membership. Moreover, we propose that these outcomes have a degree of independence – the effects of co-acting group membership are additional to and independent of, to some extent, the effects of real team membership, when these variables are assessed at the organizational level. We conceptualize the *extent of real team membership* (eRTM) in organizations as the degree to which an organization's employees report that their teams are characterized by structural interdependence, shared objectives and reflexivity. By extension, the eRTM concept suggests we also focus on the extent to which organizations and their members claim to be team-based in design but within which team members do not perceive their teams as being defined by these sub-dimensions. We term this *extent of co-acting group membership* (eCGM). We propose that the organizational system

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will be profoundly affected by the proportion of those with co-acting group and real team membership, not merely in additive effects, but also because of the synergistic or damaging consequences of processes at individual, team and organizational levels.

The numbers of deaths in healthcare organizations – patient mortality – is self-evidently important as an organizational outcome. There are difficulties of measurement (e.g. Lilford, Mohammed, Braunholtz, & Hofer, 2003) but most would regard the ratio of expected deaths (on the basis of the profile of patient admissions) to actual deaths as a key organizational outcome for healthcare. There is evidence to show that how staff are managed within hospitals predicts patient mortality. In a study of 52 hospitals, high performance human resource management policies were associated with lower patient mortality rates (West, Guthrie, Dawson, Borrill, & Carter, 2006). An observational study also demonstrated that patients whose surgical teams exhibited fewer teamwork behaviors (such as briefing and information sharing) were at greater risk of death or serious complications (Mazzocco et al., 2009). Further, communication and co-ordination failures amongst clinicians in intensive care units have been associated with higher mortality rates (Knaus, Draper, Wagner, & Zimmerman, 1986). We therefore hypothesize that:

*H9: eRTM will be associated with lower overall levels of patient mortality.*

*H10: eCGM will be associated with higher overall levels of patient mortality.*

Staff health and well-being is likely to manifest in absenteeism levels. NHS staff took off an average 10.7 days sick leave in 2009 compared with 9.7 for the public sector in the United Kingdom as a whole and 6.4 days for the private sector. Identifying factors that might predict absenteeism is therefore of great practical importance. Previous research has shown that members of the same team exhibit similar absence behavior (e.g. Chadwick-Jones, Nicholson, & Brown, 1982; Markham & McKee, 1995) and that group cohesiveness is associated with lower absence rates of group members (Xie & Johns, 2000). Further, poor

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communication and co-ordination amongst clinicians has been linked to higher staff turnover in intensive care units (Shortell et al., 1994). We therefore hypothesize that:

*H11: eRTM will be associated with lower overall levels of staff sickness absence.*

*H12: eCGM will be associated with higher overall levels of sickness absence.*

### Method

#### Sample and Procedure

The data used in this paper were collected as part of the National Health Service National Staff Survey (NHS NSS). All 387 NHS healthcare organizations in England took part in the survey, which was run by the regulatory body (Care Quality Commission) in conjunction with the authors, between October and December 2008. Each organization followed a standardized procedure with a paper questionnaire being distributed by post by an authorized external contractor. The survey covered all types of healthcare organizations including primary care, ambulance and mental health services. This study focuses on 147 acute hospitals, given that patient mortality data is only available for this type of organization. Acute hospitals provide secondary health care services, which are predominantly delivered by medical staff, nursing staff and other health professionals. Within these organizations, 120,701 questionnaires were distributed and 62,733 completed questionnaires being returned (52% response rate). A breakdown of the sample can be found in Table 1.

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Insert Table 1 about here  
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#### Measures

**Team membership.** The team membership measure was based on five items; two initial screening items to distinguish real team/co-acting group members from non-team

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members; “*Do you work in a team?*” (‘Yes’ or ‘No’); and “*How many core members are there in your team?*” (with response options ‘2-5’, ‘6-10’, ‘11-15’ and ‘More than 15’)<sup>2</sup>; And three further items to capture real team membership according to the theoretical sub-dimensions described earlier: “*Does your team have clear objectives?*” (shared objectives); “*Do you have to work closely with other team members to achieve the team’s objectives?*” (structural interdependence); and “*Does the team meet regularly to discuss its effectiveness and how it could be improved?*” (reflexivity). The response options to each question were ‘Yes’ or ‘No’ and respondents were instructed to answer the questions based on the main team that they worked in. Although the authors did not have final decision making authority in relation to the survey content, this and other measures were shaped by previous research on people management and performance (Michie & West, 2004).

Those who answered ‘No’ to the first screening question “*Do you work in a team?*” were classified as not working in a team and constituted a reference group in the analysis. While those who answered ‘Yes’ to “*Do you work in a team?*”, indicated their team comprised 15 members or less, and ‘Yes’ to the three subsequent questions listed above were classified as having real team membership. All other respondents were classified as having co-acting group membership.

For the organizational level analysis, the percentages of respondents in each organization reporting respectively real team, co-acting group and non-team membership were used. Across organizations, 37% of staff reported real team membership (with a range of 27% to 48%), and 55% reported co-acting group membership (range of 43% to 65%). Eight percent of staff reported that they did not work in a team (range of 4% to 15%).

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<sup>2</sup> This question ensured that real team membership captured an individual’s perception of a working group rather than an entire NHS department/hospital ward. Indeed, it is widely argued that a team is a relatively small collection of people (e.g., Katzenbach & Smith; 1998; Sundstrom et al., 1990), which, in the practice of acute healthcare, is likely to be no more than around 15 members (West, 2012).

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**Errors and incidents.** Staff members were asked if they had witnessed any errors and incidents that could have hurt patients or staff during the previous month. This was coded so that '1' represented having witnessed and '0' represented not having witnessed an error or incident.

**Work related injuries and illness.** Staff members were asked if, during the last 12 months, they had been injured or felt unwell as a result of the following problems at work: a) moving and handling, b) 'needlestick' and 'sharps' injuries, c) slips, trips or falls, and/or d) exposure to dangerous substances. This was coded so that '1' represented having suffered an injury or illness, and '0' represented not having suffered an injury or illness.

**Violence and harassment.** Staff members were asked if they had personally experienced incidents of physical violence or incidents of harassment, bullying or abuse from patients, relatives of patients, or other members of the public during the last 12 months.

**Turnover intentions.** Three items were used to measure turnover intentions: "*I often think about leaving this organization*"; "*I will probably look for a job at a new organization in the next 12 months*"; and "*As soon as I can find another job, I will leave this organization*". Response options were on a five-point scale, ranging from (1) "strongly disagree" to (5) "strongly agree". The mean score was 2.58 with scale reliability proving satisfactory ( $\alpha = .92$ ).

**Patient mortality.** The measure of patient mortality was based on the methodology used by Jarman et al. (1999) and represents a ratio of expected to actual deaths within each healthcare organization, referred to as Hospital Standardized Mortality Ratio (HSMR; Bottle, Jarman & Aylin, 2011; Jarman et al., 1999). An HSMR figure of 100 indicates that the number of patients dying is exactly the number that would be expected to die after taking into consideration diagnoses, age, hospital admission process (e.g., emergency or referral) and other characteristics. A figure over 100 indicates more patients dying than would be



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expected; while a figure below 100 indicates fewer patients dying than would be expected. The patient mortality data is collected annually from April 1<sup>st</sup> to March 31<sup>st</sup>. The average score for patient mortality was 99.8 with a range of 71.4 to 131.4 in 2008-09 (contemporaneous data), and 99.3, with a range of 71.9 to 117.9 in 2009-10 (subsequent data).

**Sickness absence.** The measure of sickness absence was calculated by dividing the sum total sickness absence days by the sum total working days available per month for each staff member at each healthcare organization. The sickness absence data are collected annually from April 1<sup>st</sup> to March 31<sup>st</sup>. The average score for sickness absence was 4.2%, with a range from 2.6% to 5.7% in 2008-09 (contemporaneous data), and 4.1%, with a range from 2.7% to 5.8% in 2009-10 (subsequent data).

**Control variables.** At the individual level we controlled for a number of background and demographic factors; age, gender, organizational tenure, occupational group of the respondent, whether the respondent had a disability or had direct line management responsibilities, and whether they had contact with patients. At the organizational level we controlled for the size of the organization and whether or not the organization was classified as being a ‘teaching’ hospital, given that teaching hospitals sometimes have more enlightened management practices together with advanced medical practices and technologies that could influence the research outcomes. For both the individual and organizational level analyses we also included data from a measure aimed at assessing the extent to which staff members felt valued and trusted in their work. The scale was constructed from three items (“*The people I work with treat me with respect*”; “*The people I work with seek my opinions*”, and “*I am trusted to do my job*”) and was included as a proxy measure of general affect towards the organization. Response options were on a five-point scale, ranging from (1) “strongly disagree” to (5) “strongly agree”. The mean score at the individual level was 3.89 with scale

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reliability proving satisfactory ( $\alpha = .79$ ). An aggregated version of the scale was used in the organizational level analysis so we calculated inter-rater reliability statistics to check whether it was appropriate to aggregate the data. The obtained ICC(1) and ICC(2) values were .02 and .58, so although the ICC(2) value was lower than is desirable it falls within the range advocated by Klein et al. (2000). The mean score for the scale at the organizational level was 3.89.

### **Analysis Strategy**

The first set of hypotheses (1-8) are individual level and propose that real team membership will be associated with ‘better’ outcomes (e.g. witnessing fewer errors and incidents, suffering fewer work related injuries and illness, experiencing less violence and harassment, and having weaker intentions to leave) and that co-acting membership will be associated with ‘worse’ such outcomes. Three of the outcomes (errors and incidents, injuries and illness, and violence and harassment) were coded as binary variables so we performed multilevel logistic regression and therefore report odds ratios to represent effect sizes. Intention to leave was measured on a Likert scale so we used ordinary multilevel regression (and report unstandardized regression weights to represent effects). In the analyses, the reference group was formed by the respondents who did not report team membership, so for hypotheses 1, 3 and 5 to be accepted there needed to be a significant odds ratio of *less* than 1, and for hypotheses 2, 4 and 6 to be accepted there needed to be a significant odds ratio of *more* than 1. For the remaining hypotheses to be accepted, the standardized regression weights needed to be significant and negative for hypothesis 7, and significant and positive for hypothesis 8. All analyses were performed in Mplus (Muthén & Muthén, 2007).

The second set of hypotheses (9-12) are at the organizational level and propose that the proportion of staff in an organization with real team membership will be associated with ‘better’ outcomes (e.g. lower patient mortality and lower sickness absence) and the

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proportion of staff with co-acting group membership will be associated with ‘worse’ such outcomes. We included data from two time points: outcome data contemporaneous with the data collected on team membership, and outcome data collected between 6 and 18 months after the data on team membership were collected. Indeed, we might expect a stronger relationship with outcome data measured subsequently. However, we did not control for contemporaneous outcomes when predicting subsequent outcomes due to the large correlations between the two measures.

At the organizational level, we performed polynomial regression analysis and followed the methods proposed by Edwards and Parry (1993) with the real team and co-acting group membership variables being centered on the mid-point (e.g. scores ranged from 0 to 1 so we centered on 0.5). The three control variables (size of organization, teaching status and general affect towards the organization) were standardized and entered into Model One of the regression equation and then we tested for linear and quadratic effects in Models Two and Three. Firstly, we examined whether the real team and co-acting group membership variables in combination explained additional variance in the outcomes variables in Model Two (linear) and then examined the quadratic effects in Model Three – a significant change in  $R^2$  is necessary but not sufficient evidence for a linear or quadratic effect (Edwards, 2001).<sup>3</sup> Next, we calculated the contrast estimates represented by a 10% change in real team and co-acting group membership. We chose a 10% change because in our sample the level of real team membership ranged from 27% to 48%, and co-acting group membership from 43% to 65% so there was a comparatively narrow range of scores. We were specifically interested in the contrast represented by the line of disagreement, as this shows the effect when the extent of real team membership increases and co-acting group membership decreases (or vice

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<sup>3</sup> Note: as no quadratic effects were found in our analyses we have not reported these findings

versa), so to support our hypotheses we would expect the line of disagreement to be significant (Edwards & Parry, 1993).

## Results

### Descriptive Statistics

Tables 2 and 3 present the means, standard deviations, and correlations of the variables at the individual (Table 2) and organizational level (Table 3). We have displayed only the main study variables because of the large number of dummy variable (details of which are available upon request). Table 2 shows that, as expected, there were significant negative correlations between real team membership and the four outcome variables, and significant positive correlations between co-acting membership and the four outcome variables at the individual level. Table 3 shows that, at the organizational level, there were significant negative correlations between real team membership and patient mortality and sickness absence rates. Table 3 also shows that the size of these relationships tends to be larger with subsequent data than for contemporaneous data. There was a positive correlation between co-acting group membership and patient mortality for both contemporaneous and subsequent data; while for sickness absence rates, only subsequent data was significantly correlated with co-acting group membership.

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Insert Tables 2 and 3 about here  
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### Individual Level Analysis

Table 4 presents the results of the multilevel regression analyses used to test hypotheses 1 to 8. There was partial support for hypotheses 1 and 2 as can be seen by the odds ratio of greater than 1 for co-acting group membership (1.429,  $p < .001$ ), which indicates that staff that report co-acting group membership are more likely to witness errors. However, despite witnessing fewer errors than staff with co-acting group membership, staff

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reporting real team membership do not witness fewer errors than the referent group (e.g. those not working in a team; 0.998,  $p = .939$ ).

There was full support for hypotheses 3 and 4 as can be seen by the odds ratio of greater than 1 for co-acting group membership (1.314,  $p < .001$ ), and less than 1 for real team membership (0.877,  $p = .001$ ). This supports our hypotheses that staff with co-acting group membership report suffering more work related injuries and illnesses, while staff with real team membership report suffering fewer such injuries and illnesses.

Table 4 also shows that there was full support for hypotheses 5 and 6 as the odds ratio is greater than 1 for co-acting group membership (1.381,  $p < .001$ ), and less than 1 for real team membership (0.883,  $p < .001$ ). This supports our hypotheses that staff reporting co-acting group membership experience more violence and harassment, while staff reporting real team membership experience fewer such behaviors at work.

Finally, Table 4 shows that there was partial support for hypotheses 7 and 8 as illustrated by the positive regression coefficient for co-acting group membership ( $B = 0.234$ ,  $p < .001$ ), which indicates that staff reporting co-acting group membership are more likely to be considering leaving their current employment. Staff reporting real team membership are no more likely to report intending to leave than the referent group (those not working in a team;  $B = -0.014$ ,  $p = .307$ ), but they are less likely to be considering leaving their current employment than staff with co-acting group membership.

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Insert Table 4 about here  
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### **Organizational Level Analysis**

Table 5 presents the results of polynomial regression analyses used to test hypotheses 9 to 12. As can be seen in Table 5, there was support for hypotheses 9 and 10 as in

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combination real team and co-acting group membership accounted for 6.5% and 7.6% of the variance in contemporaneous and subsequent patient mortality in Model Two of the regression equation. These are linear effects and we identified no significant quadratic effects. Furthermore, a 10% increase in real team membership (and similar reduction in co-acting group membership) would be associated with a reduction of 6.93 in contemporaneous patient mortality ( $F(1,141) = 9.907, p = .002$ ), and a reduction of 6.21 in subsequent patient mortality ( $F(1,141) = 9.833, p = .002$ ).

The level of real team membership ranged from 27% to 48%, and co-acting group membership from 43% to 65%, so we examined other combinations which were broadly representative of the level and range of real team and co-acting group membership in our study. For contemporaneous levels of patient mortality, a combination of 30% eRTM and 70% eCGM would be associated with patient mortality of 104.6; 40% eRTM and 60% eCGM would be associated with patient mortality of 97.6; and 50% eRTM and 50% eCGM would be associated with patient mortality of 90.5. Similarly, for subsequent levels of patient mortality the same combinations would be associated with patient mortality levels of 100.7, 94.5 and 88.3 respectively.

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Insert Table 5 about here  
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Table 5 shows that there was also partial support for hypotheses 11 and 12, with real team and co-acting group membership in combination accounting for 8.8% of the variance in subsequent sickness absence rates (although there was no effect for contemporaneous level or quadratic effects). A 10% increase in real team membership (and similar reduction in co-acting group membership) would be associated with a reduction of .36, or an 8% reduction, in sickness absence rates ( $F(1,139) = 7.041, p = .009$ ). Further, a combination of 30% eRTM

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and 70% eCGM would be associated with a sickness absence rate of 4.0%; 40% eRTM and 60% eCGM with a sickness absence rate of 3.7%; and 50% eRTM and 50% eCGM with a sickness absence rate of 3.3%.

### **Discussion**

The findings from this research reveal a broadly consistent pattern of results at the individual and organizational levels of analysis. At the individual level, co-acting group membership was associated with a greater likelihood of witnessing errors or incidents in the previous month that could have harmed patients or staff, in comparison with those reporting real team membership, and those reporting that they did not work in teams. In contrast, those who reported real team membership were less likely than those with co-acting group membership to report witnessing such events, though no less likely to than those who reported that they did not work in teams. This is possibly because the small minority of NHS staff who report non-team membership are likely to undertake far less complex high-stakes tasks, which by their very nature, are this less prone to error. Further, as they do not report identified team membership, non-team members are less likely to take notice and pay attention to the work of others, and are thus less prone to witnessing occurrences such as errors, due to the relative isolation imposed by their work design.

There were stronger associations between team membership and the prevalence of injuries or illness. Those with real team membership reported fewer such experiences than those with co-acting group membership and non-team members. Similarly, real team membership was associated with fewer reports of violence and harassment, in comparison to both those reporting co-acting group membership and non-team members. Co-acting group members reported higher levels of such incidents than the other two groups. Finally, at the individual level, those reporting real team membership had a lower intention to leave their current employment than those with co-acting group membership. Their turnover intentions

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were no lower however than those who reported not working in teams. Again, this is possibly because, like those with real team membership, non-team members feel that their work environment is meeting their expectations. Whereas those with co-acting group membership may feel disappointed and frustrated by the structure and functioning of their team, those with non-team membership are far more likely to be satisfied with their work design arrangements and thus report equivalent levels of intention to leave as those with real team membership.

The hypotheses were again supported in relation to patient mortality. The greater the proportion of staff reporting co-acting group membership, the higher the levels of subsequent patient mortality; the corollary was also confirmed - the higher the proportion of staff reporting real team membership, the lower were subsequent levels of patient mortality. The analysis showed that these effects were somewhat independent. A similar pattern of results was revealed in relation to staff sickness absence. The more staff in an organization reported real team membership, the lower the levels of sickness absence; and the higher the level of co-acting group membership, the higher the levels of sickness absence.

When employees are delivering complex care in an environment where multidisciplinary and coordinated interventions are required, as is the case with acute healthcare, real team membership appears to be vital. If team members are clear about their team's objectives, work closely and interdependently and have regular reflexive team discussions about performance, the delivery of care is likely to be safer and of higher quality (Firth-Cozens, 2001; Salas et al., 2007). Shared objectives ensure team members are pursuing the same goals rather than competing or unclear goals. Interdependent working ensures better coordination of efforts and probably more consistent interaction and communication with patients. Moreover, reflexivity enables team member learning from both effective delivery of care and from errors (Edmondson, 1999; Tjosvold, Tang & West, 2004). Indeed, we



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conducted post hoc analysis to check the differential impact of each of the real team membership sub-dimensions in isolation and found that that reflexivity was consistently most important in terms of predicting outcomes (although the differences in effect size were not substantially different from the overall calculation of real team membership). The importance of reflexivity is concurrent with previous research on healthcare teams (e.g., Kolbe et al., 2013; Smith-Jentsch, Cannon-Bowers, Tannenbaum, & Salas, 2008; Tannenbaum & Cerasoli, 2012; Vashdi, Bamberger, & Erez, 2012). However, it should be noted that removing any one of the three sub-dimensions from the real team membership calculation did not significantly strengthen the findings and in most cases weakened them, thus supporting our assertion that real team membership is a symbiotic construct.

As our findings demonstrate, real team membership is associated with lower levels of witnessed errors, near misses, work related injuries and experiences of violence and abuse. In contrast, those reporting co-acting group membership also experienced more errors, injuries and frustrations, signaling dis-integration and contributing to an atmosphere of tension. The patient experience is often one of low control, heightened pain and anxiety and great uncertainty, exacerbated by their being in an environment that is unusual, puzzling and often aversive (Sexton, Thomas, & Helmreich, 2000). A team of professionals that appears at odds, disorganized, frustrated or confused, is likely to exacerbate these negative patient experiences, resulting in outbursts of anger (from them or their relatives/friends) and sometimes violence. It is also not surprising that intentions to leave current employment were higher amongst those reporting co-acting group membership, since they are more likely to witness dangerous errors and incidents, suffer work related injuries or illness, and to experience violence and abuse in their work environment (Quine, 2001; Zellars, Tepper, & Duffy 2002). The individual level findings emerged from analysis that controlled for a number of potentially confounding variables, including age, gender, occupational group,

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organizational tenure, whether staff had patient contact, managerial responsibilities or a disability. The consistency of the findings, independent of these factors, therefore builds some confidence in their robustness. Moreover, a proxy measure of respondents' general affect towards the organization was included as a control variable. Indeed, it could be that an individual who is positive about his /her organization would view experiences at work (e.g. witnessed errors/experienced violence) in a more benign light. This would be associated too with a lower intention to quit than would be the case among employees with a less positive attitude towards their organization (Burke, Brief, & George, 1993). Thus, by controlling for this proxy measure of general organizational affect, the analysis offers us greater confidence in our interpretation of the meaning of the findings, though it clearly does not rule out the possible confounding effects of affectivity (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

The most striking finding from the organizational level analysis is the strong relationship between team membership and patient mortality. The greater the proportion of staff that report the characteristics of real team membership, the lower the levels of patient deaths relative to what would be expected on the basis of admissions profiles. And the greater the proportion of staff who report the characteristics of co-acting group membership, the higher the levels of patient deaths, relative to what would be expected on the basis of admissions profiles. This is consistent with the findings from the individual level of analysis. Where more errors are being made, patients are clearly at greater risk. Such errors could include medication errors (one of the commonest cause of preventable deaths in hospitals), errors of omission of care (resulting in bed ulcers, for example) and errors of commission in giving the wrong treatment to patients (Kohn et al., 1999). In short the findings suggest that real team membership in hospitals saves lives.

Furthermore, the findings reveal that when higher proportions of staff report the characteristics of real team membership, sickness absence is significantly lower, whereas the

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opposite is true for the proportion of staff reporting co-acting group membership. Health service professionals are likely to be motivated to do their jobs well and provide effective and compassionate care for patients, consistent with their vocational orientation (Maudsley, Williams, & Taylor, 2007; Price, 2009). Witnessing high levels of errors, experiencing illness and injury, being assaulted and harassed are all inconsistent with that aspiration and are experiences that are likely directly (in the case of violence or injuries experienced at work) or indirectly (in the case of witnessing errors or experiencing harassment) to cause those with co-acting group membership to take time off from work (Sofield & Salmond, 2003; Zellars et al., 2002); outcomes which are financially significant not only for NHS hospitals (Boorman, 2009), but organizations at large. The organizational level findings were independent of the hospital size and also of whether the hospital was a teaching institution, engaged in the formal training of medical and nursing students. Again, the proxy measure of general affect towards the organization was included as a control variable at the organizational level of analysis. While this control cannot entirely rule out the possibility that the findings are explicable in terms of differences between hospitals in staff attitudes rather than the nature of team membership, the inclusion of the control weakens the likelihood of that possibility.

Overall, the findings suggest that real team membership is beneficial for both individual's outcomes and organizational performance. The data also indicate that co-acting group membership is associated with poorer outcomes for individuals, more so in some instances than not being a member of a team, and certainly worse than real team membership. Finally, the data show that the greater the proportion of individuals who report co-acting group membership, the worse is organizational performance. These findings have great implications for our understanding of teamwork and team membership in organizations. As Lickel et al. (2000, p.223) note '*much of what people consider important, from the work they accomplish to the emotions they feel, is influenced by their membership in groups.*'

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Understanding individual perceptions of their focal team's characteristics and how these influence individual, team, and organizational outcomes is therefore of pivotal importance.

The tendency to lump together as real teams all entities described by organizational members as 'teams' may well be misguided both theoretically and empirically (Tannenbaum, Mathieu, Salas, & Cohen, 2012b; West & Lyubovnikova, 2012). Indeed, researchers may be including within one category, entities that are fundamentally different (cf. Hackman, 2002, 2012; Saltman et al., 2007), which obfuscates theoretical understanding and considerably reduces the value of research in informing practice. Our findings suggest that individual perceptions of team membership afford a novel and interesting way of examining individual and organizational outcomes.

While the specific nature and characteristics of real team membership (structural interdependence, shared objectives and reflexivity) deserve further elaboration and debate, this study was this first empirical attempt to operationalize the real team concept at multiple levels of analysis. However, there is a lively and on-going discussion in the literature on the conceptualization of teams and team membership (e.g., Hackman, 2012; Hollenbeck et al., 2012; Mortensen, 2014; Tannenbaum et al., 2012; Wageman et al., 2012; West & Lyubovnikova, 2012), and thus rather than concluding that the approach taken here is the definitive and optimal way of defining and measuring real team and co-acting group membership, we instead aimed to contribute to this emerging and dynamic discussion using findings from the secondary data available to us. Indeed, treating reflexivity as a definitional criterion, as opposed to an enabling condition may be considered by some as a departure from the existing literature. However, in the context of health care, which by nature is complex, requires multi-disciplinary work and where continuous improvement in quality is a key requirement, reflexivity can be considered as a defining characteristic of real team membership. Despite being outside of the authors' control, the precise wording of the sub-

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dimension items was also far from ideal (particularly in relation to shared objectives, which focused more on clarity than on sharedness per se). We therefore strongly encourage future research to further examine the notion of real team and co-acting group membership, its possible further sub-dimensions or related constructs (such as membership stability), and how these could be more carefully operationalized. Furthermore, in real life organizational contexts, characterized by complex multi-team systems (Marks et al., 2005), varying team life cycles (Hackman, 2012), and multiple team membership (O’Leary et al., 2011), as well as the methodological limitations imposed by the design of the NHS NSS, nesting individuals into teams was not possible in the current study. Thus we followed an approach adopted by others in the recent literature, analyzing and measuring team characteristics at the individual level (e.g., Bienefeld & Grote, 2013, Klein, Ziegert, Knight, & Xiao, 2006; Lyndon et al., 2011). However, as noted below, future research should endeavor to overcome these operational challenges, building on the handful of existing studies that have examined the real team construct at the group level (Hackman & O’Conner, 2005; Wageman, 2001), to further explore ideas about real team and co-acting group membership. This could include considering different conceptualizations of team membership (formal, identified, emergent), and how a team member’s own definition of their membership may also vary over time and across situations (Mortensen, 2014).

Interpreting the findings from this research should be tempered by awareness of the weaknesses in the study design. First among these is the conceptualization of real team and co-acting group membership as a dichotomy. Employees who reported working in teams were categorized as either having real team or co-acting group membership, rather than being located on a single continuous dimension of team membership. Although this methodological limitation was a necessary requirement of the sponsors of the NHS NSS, it is not ideal from a research perspective, given that the real team membership sub-dimensions are typically

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conceptualized on a continuum. Using a dichotomous, categorical approach rather than a continuous variable is likely to reduce the observed strength of any associations and the power of hypothesis tests (Altman & Royston, 2006), so although this is a clear weakness, we do not believe it fundamentally undermines confidence in the results. Moreover, research suggests that individuals' reports of real team membership are correlated with objective observations of team processes during meetings (Richardson, 2010), thus providing encouraging support for the validity of the construct.

Second, a number of the individual level outcome measures used dichotomous variables. Future research could improve power and sensitivity by using measures of the frequency with which staff experienced these problems. It is unlikely however that this weakness could account for the associations we discovered between team membership and individual outcomes because, if anything, it is likely to lead to an underestimate of the strength of associations. Some of the dependent variable items themselves were also worded in a way that could not disentangle errors witnessed in a respondents own team, versus errors witnessed in their immediate vicinity, and thus possibly committed by other teams in the multi-team system. Even in the latter case however, we would still expect that the learning inherent in real team membership (particularly via reflexivity) would have a positive impact beyond the immediate boundaries of the team at hand, and also influence the way in which real team members interact with other teams, reinforcing team objectives and norms during inter-team exchanges, and building a climate for safety. However, future research using primary data collection methods should endeavor to select more focused and detailed measures of the dependent variables we considered.

Third, due to data limitations imposed by the NHS NSS, we were unable to account for team membership in our multilevel models. Fourth, as already noted, measures at the individual level are all based on self-report so there is the possibility that associations are

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affected by individuals' tendencies to see all aspects of their work experience (including the characteristics of their teams) in a positive or negative light. The use of a control variable that assessed respondents' views of how they were treated by their organization was used as a proxy measure of organizational affect, and thus provided some reassurance that such measurement confounds might be minimized. It is acknowledged that the items used to create this proxy measure were not a direct assessment of affect, and as indicated by the low ICC(1) measure, they do not represent a true organizational climate measure (although this is probably to be expected as the referent of the items was the individual respondent). However, they were deemed the most appropriate items available in the survey to capture such a measure. One of the strengths of this study, which somewhat ameliorates this concern, is the use of data collected both contemporaneously with and subsequent to, the data collected on team membership, particularly because associations with subsequent data were generally stronger. An additional control would have been to include prior measures of the dependent variables wherever possible but this represents too strong a control because in many cases much of the variance in the subsequent measure is absorbed by controlling for prior values.

Fifth, although the measure of patient mortality is widely used and accepted as an important indicator of hospital outcomes, there are ongoing debates about its validity as a pure measure of performance (Lilford & Pronovost, 2010). This is because there are variations resulting from demographic profiles of local populations and because hospitals adopt different policies in relation to admissions (for example, in admitting terminally ill patients who might have a 'better' death at home). By controlling for patient diagnosis, admission procedures and age (Jarman et al., 1999) we took account of most threats to the validity of this measure. Nevertheless, it remains a contested measure in healthcare, though widely used in practice by policy makers and managers as an indicator of care quality.

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The study opens a number of avenues for future research. Firstly, as this study was conducted in the healthcare sector there is a need to conduct further research in other sectors (such as manufacturing, private services and the voluntary sector) to determine whether the findings are generalizable. It is also important to consider whether results are consistent across countries and cultures, particularly those with collectivist orientation towards team-based working, where findings might differ from the individualistic context of the current study. Alternative dependent variables such as job satisfaction, patient satisfaction and quality matrices, could also be considered to examine whether the pattern of results holds for more positively valenced outcomes.<sup>4</sup> Secondly, the study design only enabled us to examine an individual's membership to their main team. However, the complexity of healthcare delivery requires that professionals work within a number of teams, making the construct of multiple team membership (O'Leary et al., 2011) highly pertinent to future studies. Future studies at the group level could also examine within team agreement and membership model divergence (Mortensen, 2014) on real team/co-acting group membership, as well as the extent to which different types of membership predict external manager ratings of team performance. Finally, given the need for temporal considerations in research on teams (Ilgen et al., 2005), one could examine how real team membership changes over a team's life cycle, thus helping to build a clearer picture of the causality nexus.

The findings highlight the current prevalence of co-acting group membership in the NHS, which is likely attributed to an organizational climate crippled by limited resources, unclear goals, overlapping priorities, distracted attention and unnecessary bureaucracy (Dixon-Woods et al., 2014); all of which create barriers to the emergence of real team membership. However, the findings suggest that organizations that assign employees to work in teams should ensure minimally that those teams have shared objectives; that team working

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<sup>4</sup> We thank one for the anonymous reviewers for this suggestion.



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is characterized by structural interdependence (and collectives are not simply labelled 'teams' based on presumed intuitive benefits); and that opportunities for regular reflexivity during team meetings are in place. This could be partly achieved through team training initiatives that educate team members on the importance of real team membership (Weaver, Dy, & Rosen, 2014). While real teams are not necessarily pure or unproblematic (as '24-karat' might suggest) they do serve to lay the foundations for team effectiveness in organizations (Hackman, 2002). Thus, if the findings from this study could be replicated across industry, these effects would translate to a sizeable impact upon organizational and national productivity and profitability. Pursuing this research is therefore not just theoretically relevant but practically important too.

### **Conclusion**

Team working has been a vital means by which we have hunted, innovated, and advanced throughout history. Only in the last few hundred years have we systematically tried to replicate this form in larger organizational entities. The research reported here suggests that there is limited understanding of how to translate the core properties of team working into organizational practice effectively and widely. How to promote real team membership, and indeed real teams, in organizations represents an important research agenda in applied psychology. It is crucial that researchers therefore focus more clearly on what is meant by team work, teams and team membership, both theoretically and practically, in order that understanding can be effectively and coherently advanced in the service of individual, team and organizational performance. We hope that the study reported here provides a springboard for such debates and theoretical developments.

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Table 1 *Demographic characteristics of the sample*

		%
Age	Between 16 and 30 yrs old	16
	Between 31 and 40 yrs old	24
	Between 41 and 50 yrs old	32
	Over 51 and 65 yrs old	29
Gender	Male	20
	Female	80
Tenure	Less than a year	10
	Between 1 and 2 yrs	10
	Between 3 and 5 yrs	20
	Between 6 and 10 yrs	23
	Between 11 and 15 yrs	12
	More than 15 years	26
Ethnic background	White	85
	Asian	8
	Black	4
	Chinese	1
	Mixed	1
	Other	1
Long standing illness, health problem or disability	Yes	11
	No	89
Face-to-face contact with patients	Yes	88
	No	12
Line management responsibilities	Yes	31
	No	69
Occupational group	Nurse / Nursing assistant	38
	Medical	8
	Allied Health Profession / Healthcare Scientists	19
	Administrative	22
	Managerial	6
	Maintenance / support staff	2
	Other	5

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Table 2 Means, standard deviations, and correlations of study variables at the individual level

	Mean	SD	1.	2.	3.	4.	5.
1. Real team membership	0.37	0.48					
2. Co-acting group membership	0.55	0.50	-0.84				
3. Witnessed an error or incident involving patients or staff	0.38	0.49	-0.07	0.11			
4. Suffered work related injury or illness	0.17	0.37	-0.09	0.10	0.16		
5. Experienced violence or harassment	0.26	0.44	-0.10	0.13	0.26	0.16	
6. Turnover intentions	2.58	1.04	-0.16	0.15	0.12	0.13	0.14

*Note.* All categorical variables were coded as Yes = 1 otherwise = 0.  
All correlations are significant  $p < 0.01$

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Table 3 Means, standard deviations, and correlations of study variables at the organizational level

	Mean	SD	1.	2.	3.	4.	5.
1. Real team membership	0.37	0.04					
2. Co-acting group membership	0.55	0.04	-.872**				
3. Patient mortality (contemporaneous)	99.78	10.26	-.207*	.163*			
4. Patient mortality (subsequent)	99.26	9.30	-.265**	.177*	.695**		
5. Sickness absence (contemporaneous)	4.18	0.65	-.191*	.140	.147	.306**	
6. Sickness absence (subsequent)	4.15	0.60	-.299**	.185*	.217**	.314 **	.845**

Note. \*  $p < 0.05$ , \*\*  $p < 0.01$

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Table 4 *Results of multi-level logistic and hierarchal multiple regression for individual level outcomes*

Hypothesis	1-2		3-4		5-6		7-8	
Dependent variable	Witnessed an error or incident		Suffered a work related injury or illness		Experienced violence or harassment		Turnover intentions	
Within level	OR	P value	OR	P value	OR	P value	Estimate	P value
Real team membership	0.998	$p = .939$	0.877	$p = .001$	0.883	$p < .001$	-0.014 (0.014)	$p = .307$
Co-acting group membership	1.429	$p < .001$	1.314	$p < .001$	1.381	$p < .001$	0.234 (0.013)	$p < .001$
Gender	1.186	$p < .001$	1.017	$p = .594$	0.863	$p < .001$	0.154 (0.011)	$p < .001$
Age: 16 – 30 yrs. old	1.984	$p < .001$	1.305	$p < .001$	1.658	$p < .001$	0.415 (0.015)	$p < .001$
Age: 31 – 40 yrs. old	1.423	$p < .001$	0.964	$p = .279$	1.257	$p < .001$	0.294 (0.011)	$p < .001$
Age: 41 – 50 yrs. old	1.252	$p < .001$	1.003	$p = .916$	1.091	$p = .001$	0.242 (0.011)	$p < .001$
Ethnic background: Asian <sup>b</sup>	0.686	$p < .001$	1.204	$p < .001$	0.720	$p < .001$	-0.067 (0.017)	$p < .001$
Ethnic background: Black	0.772	$p < .001$	1.001	$p = .993$	0.916	$p = .073$	-0.005 (0.022)	$p = .808$
Ethnic background: Chinese	0.848	$p = .125$	0.956	$p = .750$	0.805	$p = .072$	0.072 (0.052)	$p = .167$
Ethnic background: Mixed	0.869	$p = .114$	1.373	$p = .002$	0.998	$p = .980$	0.100 (0.042)	$p = .017$
Ethnic background: Other	0.843	$p = .043$	1.396	$p = .001$	0.847	$p = .076$	0.017 (0.041)	$p = .672$
Tenure: Less than a year <sup>c</sup>	0.706	$p < .001$	0.851	$p = .001$	0.711	$p < .001$	-0.214 (0.017)	$p < .001$

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Tenure: 1 – 2 yrs	0.875	$p < .001$	1.168	$p = .001$	0.954	$p = .243$	-0.011 (0.017)	$p = .512$
Tenure: 3 – 5 yrs	0.951	$p = .084$	1.251	$p < .001$	1.025	$p = .428$	0.056 (0.013)	$p < .001$
Tenure: 6 – 10 yrs	1.021	$p = .438$	1.211	$p < .001$	1.102	$p = .001$	0.119 (0.012)	$p < .001$
Tenure: 11 –15 yrs	0.970	$p = .342$	1.100	$p = .019$	1.038	$p = .283$	0.076 (0.015)	$p < .001$
Occupational group: Nurse / Nursing assistant <sup>d</sup>	2.179	$p < .001$	1.254	$p < .001$	2.585	$p < .001$	0.242 (0.020)	$p < .001$
Occupational group: Medical	2.788	$p < .001$	0.802	$p = .001$	1.383	$p < .001$	0.005 (0.024)	$p = .841$
Occupational group: Allied health professional / Healthcare scientists	1.570	$p < .001$	0.972	$p = .610$	0.946	$p = .314$	0.202 (0.021)	$p < .001$
Occupational group: Administrative	0.514	$p < .001$	0.657	$p < .001$	0.880	$p = .021$	0.242 (0.020)	$p < .001$
Occupational group: Maintenance / support staff	0.789	$p < .001$	1.188	$p = .008$	0.544	$p < .001$	-0.035 (0.025)	$p = .160$
Occupational group: Managerial	0.726	$p < .001$	0.329	$p < .001$	0.554	$p < .001$	0.241 (0.036)	$p < .001$
Long standing illness, health problem or disability	1.363	$p < .001$	2.068	$p < .001$	1.404	$p < .001$	0.150 (0.013)	$p < .001$
Face-to-face contact with patients	1.602	$p < .001$	1.400	$p < .001$	4.579	$p < .001$	0.030 (0.013)	$p = .020$
Line management responsibilities	1.922	$p < .001$	0.859	$p < .001$	1.331	$p < .001$	0.049 (0.010)	$p < .001$
‘Feeling valued by colleagues’	0.883	$p < .001$	0.787	$p < .001$	0.882	$p < .001$	-0.341 (0.006)	$p < .001$

Note: <sup>a</sup> comparator group ‘Age: Over 50 yrs old’; <sup>b</sup> comparator group ‘Ethnic background: White’; <sup>c</sup> comparator group ‘Tenure: More than 15 yrs’; <sup>d</sup> comparator group ‘Occupational group: Other’.

Figures in the table are odds ratios, with the exception of staff turnover intention where the figures are unstandardized coefficients (with standard errors in parentheses).

MPlus does not produce odds ratios for ‘Between level’ controls: trust size, and teaching status of the employing organisation.

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Table 5 Results of polynomial regression for organizational level outcomes

Hypothesis	9-10				11-12			
	Patient mortality				Sickness absence			
Dependent variable	Contemporaneous		Subsequent		Contemporaneous		Subsequent	
<b>Model one (controls)</b>								
Trust size	-0.445 (0.388)	$p = .254$	-0.157 (0.352)	$p = .656$	0.034 (0.026)	$p = .195$	0.026 (0.024)	$p = .271$
Teaching status	-5.080 (2.114)	$p = .018$	-4.305 (1.914)	$p = .026$	0.044 (0.157)	$p = .778$	0.039 (0.129)	$p = .762$
Feeling valued by colleagues	-15.112 (17.235)	$p = .352$	-35.162 (15.603)	$p = .026$	-0.037 (1.349)	$p = .978$	-1.492 (1.055)	$p = .159$
<b>Model two (linear effects)</b>								
Real team membership (eRTM)	-75.872 (42.346)	$p = .075$	-96.255 (38.086)	$p = .013$	-4.833 (3.142)	$p = .127$	-8.206 (2.544)	$p = .002$
Co-acting group membership (eCGM)	-6.554 (42.036)	$p = .876$	-34.146 (37.807)	$p = .308$	-2.524 (3.216)	$p = .434$	-4.591 (2.538)	$p = .073$
Total R <sup>2</sup>	.148		.162		.052		.117	
Change R <sup>2</sup> due to team membership variables	.065	$p = .005$	.076	$p = .002$	.029	$p = .185$	.088	$p = .001$
<b>Line of interest</b>								
eRTM = - eCGM line	-6.932 $F(1,141) = 9.907$ $p = .002$		-6.211 $F(1,141) = 9.833$ $p = .002$		-0.231 $F(1,112) = 1.825$ $p = .179$		-0.362 $F(1,139) = 7.041$ $p = .009$	

Note. Figures in the top part of the table are unstandardized regression coefficients.

Figures in the bottom part of the table are the constant estimates for the line of (dis)agreement representing the change associated a one unit change in the focal variables.