



# Improvements in Patient Safety Culture: A National Taiwanese Survey, 2009 to 2016

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## Objectives

To assess national trends in patient safety culture in Taiwan.

## Methods

A Safety Attitudes Questionnaire (SAQ) was distributed to 144 hospitals from 2009 to 2016 (N=392,341 surveys). The positive response rate (%) for each question was calculated by dividing positive responses (defined as scores 4 or 5 on the Likert scale, slightly agree or strongly agree) by total responses for that question. We used a multiple linear regression model to adjust for covariates, with survey year as our independent variable. Covariates for our linear regression model included age, managerial/supervisory responsibility, incident reporting, role, working hours, education level, and frequency of contact with patients. The adjusted positive response rate for each dimension and year was computed from regression model at mean value of covariates. All positive response rates reported are after adjustment.

Figure 1. Adjusted Positive Response Rate for Patient Safety Culture, by Year

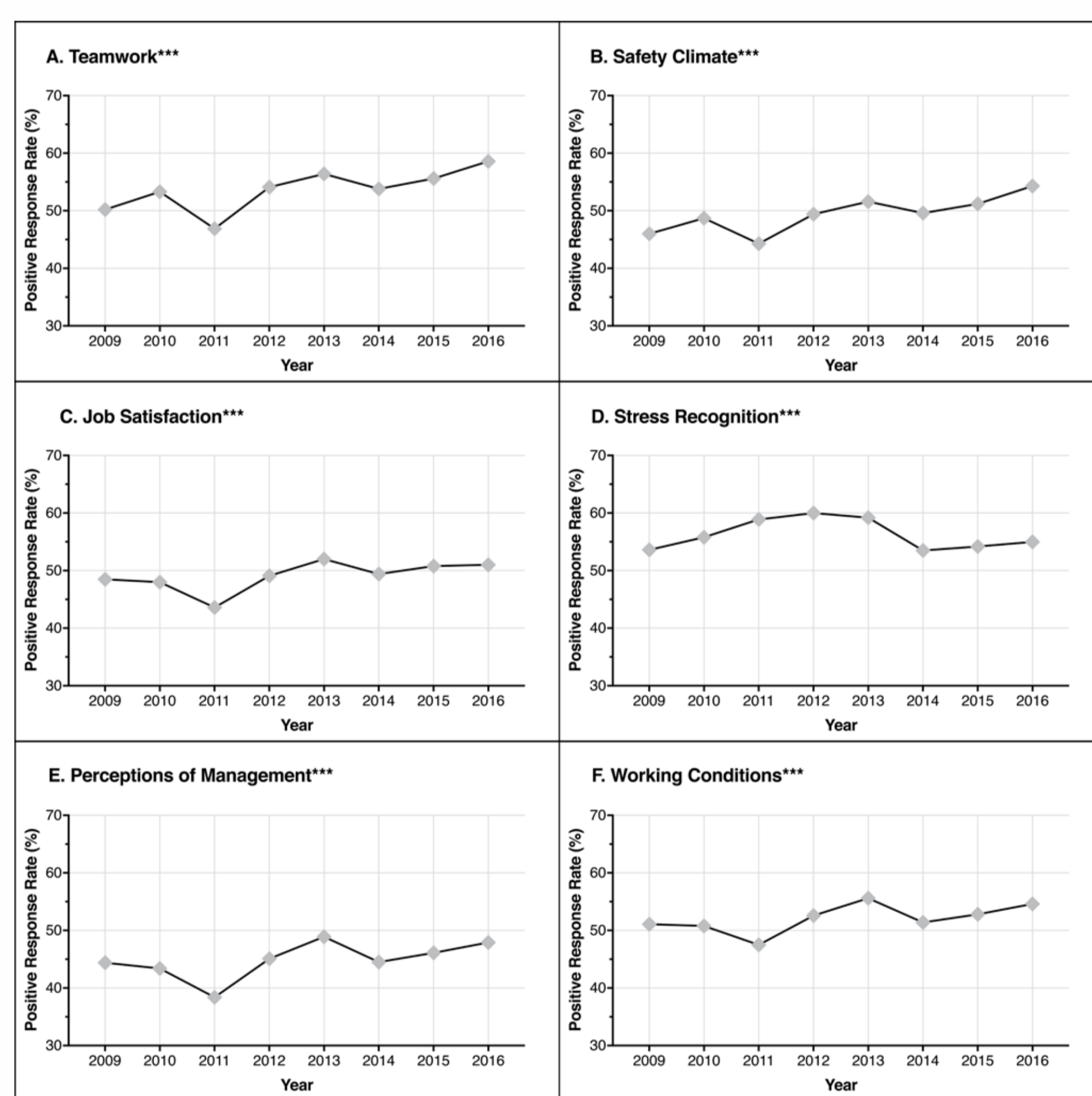


Table 1. Adjusted Positive Response Rate for Patient Safety Culture, 2009 vs. 2016<sup>1</sup>

Dimension	Year		Difference 2009 vs 2016 (%) (95% CI)	P Value <sup>2</sup>
	2009 (n=23,780) (%)	2016 (n=85,542) (%)		
Teamwork	50.2	58.6	8.4 (8.3 to 8.6)	<0.001
Safety Climate	46.0	54.3	8.2 (8.1 to 8.4)	<0.001
Job Satisfaction	48.5	51.0	2.4 (2.3 to 2.6)	<0.001
Stress Recognition	53.6	55.0	1.4 (1.3 to 1.4)	<0.001
Perception of Management	44.4	47.9	3.5 (3.4 to 3.7)	<0.001
Working Conditions	51.1	54.6	3.6 (3.4 to 3.7)	<0.001

<sup>1</sup>Models were adjusted for age, managerial/supervisory responsibility, number of cases, role, working hours, education level, and frequency of contact with patients.

<sup>2</sup>P values were calculated from Welch's t-test.

## Results

SAQ dimensions of teamwork, safety climate, job satisfaction, stress recognition, management, and working conditions significantly increased in Taiwan over a period of 7 years, with an all-composite improvement of 4.6% (P<0.001)(table 1).

The results of the TPSCSP from 2009 to 2016, stratified by dimension, are shown in Figure 1. In general, the adjusted positive response rates for each dimension were around 50%, except for stress recognition and perception of management. Stresses from work were well acknowledged by respondents (reaching nearly 60% in 3 years before falling in 2014 and plateauing) while perceptions of hospital management were generally poor (below 50% throughout the duration of the survey).

All-composite improvements for regional hospitals (6.7%) and community hospitals (7.0%) were greater than medical centers (4.0%). Improvements in patient safety culture for regional and community hospitals primarily occurred in teamwork (regional hospitals, 10.4% [95% confidence interval [CI], 10.2 to 10.6]; community hospitals, 8.5% [95% CI, 8.0 to 9.0]) and safety climate (regional hospitals, 11.1% [95% CI, 10.9 to 11.4]; community hospitals, 11.3% [95% CI, 10.7 to 11.8]) (P<0.001, all differences) (table 2).

## Conclusions

In this national longitudinal study in Taiwan, we report improvements across all patient safety culture factors from 2009 to 2016. Notably, all-composite improvement in Taiwan was 4.6%, three-fold higher than that of the United States across a similar time period (Campione J, Famolaro T, 2018). With the exception of stress recognition at community hospitals, patient safety culture in community and regional hospitals improved more than that of medical centers. Smaller improvements in patient safety culture at medical centers compared with that of community and regional hospitals may be explained by high baseline perceptions of patient safety culture for medical centers, leading to less room for improvement in subsequent years. Community hospitals in particular may have had less resources and training to improve patient safety culture until the introduction of nationwide campaigns, initiatives, and accreditation standards from 2008 and onwards (table 3).

Table 2. Changes in Patient Safety Culture by Hospital Classification, 2009 vs. 2016<sup>1</sup>

Dimension	Medical Center (n=17)		2009 vs. 2016 (%) (95% CI)	Regional Hospital (n=63)		2009 vs. 2016 (%) (95% CI)	Community Hospital (n=64)		2009 vs. 2016 (%) (95% CI)
	2009	2016		2009	2016		2009	2016	
Teamwork	51.8	59.9	8.1 (7.9 to 8.4)	47.0	57.4	10.4 (10.2 to 10.6)	49.9	58.4	8.5 (8.0 to 9.0)
Safety Climate	48.7	55.9	7.2 (6.9 to 7.4)	42.0	53.1	11.1 (10.9 to 11.4)	41.5	52.7	11.3 (10.7 to 11.8)
Job Satisfaction	50.4	51.7	1.3 (1.0 to 1.5)	45.2	50.4	5.2 (4.9 to 5.4)	47.1	50.7	3.6 (3.0 to 4.1)
Stress Recognition	55.0	56.5	1.6 (1.5 to 1.7)	53.3	53.9	0.5 (0.4 to 0.7)	45.4	53.1	7.8 (7.4 to 8.1)
Perception of Management	46.5	49.5	3.0 (2.8 to 3.2)	40.6	46.6	6.0 (5.8 to 6.2)	42.7	46.8	4.2 (3.7 to 4.6)
Working Conditions	54.5	57.3	2.8 (2.6 to 3.0)	46.1	52.8	6.7 (4.5 to 6.9)	44.8	51.4	6.6 (6.1 to 7.1)

Table 3. National Healthcare Quality and Patient Safety Initiatives in Taiwan

Campaign/Initiative	Period	Healthcare Organization(s)	Objective/Outcome
Taiwan Quality Indicator Program (TQIP) and Taiwan Clinical Performance Indicator (TCPI)	1999 - 2011 (TQIP) 2011 - present (TCPI)	JCT	National healthcare quality monitoring
Healthcare Quality Improvement Campaign (HQIC)	2000 - present	JCT	National healthcare quality improvement activities
Taiwan National Adverse Drug Reaction Reporting System (ADR)	1998 - present	T-FDA, MoHW	National drug adverse event reporting system
Patient Safety Committee	2003 - present	MoHW	Policy initiatives; yearly meeting
National Patient Safety Goals	2004 - present	MoHW	Yearly updated patient safety goals
Taiwan Patient Safety Reporting System (TPSR)	2004 - present	MoHW	Nation-wide voluntary, non-punitive, and anonymous incident reporting system
Root Cause Analysis (RCA)	2005 - present	JCT	Standard to investigate adverse incidents
Break Through Series (BTS)	2006 - present	JCT	Annual patient safety topic for participating hospitals
Team Resource Management (TRM)	2008 - present	JCT	Training programs for participating hospitals
Patient Safety Culture Survey (TPSCSP)	2009 - present	JCT	Nationwide, annual survey for participating hospitals
Human factor analysis system	2012 - present	JCT	National campaign
Bundle of cares for invasive procedures	2012 - present	T-CDC	Became national standard
Surgical Site Infection (SSI) control	2012 - present	T-CDC	Became national standard
Resilience initiatives	2014 - present	JCT	Training programs for participating hospitals
Shared Decision Making (SDM)	2016 - present	MoHW	Government-funded, ongoing project for patient-centered healthcare