

# Epidemiology of occupational injuries among insured workers in Saudi Arabia between 2004 and 2016

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This is a retrospective analysis of annual reports on occupational injuries issued by the national social insurance agency of the Kingdom of Saudi Arabia (KSA) for the years 2004 through 2016. For each criterion we calculated an index based on the equation  $N_y/N_{ref} \times 100$ , where  $N_y$  is the number of occupational injuries by a specific criterion in a specific year  $Y$ , and  $N_{ref}$  is the number of injuries in the corresponding criterion in the reference year, i.e. 2004. We also calculated the number of injuries to number of workers ratio ( $N_y/N_w$ ) for different occupations and economic sectors to get a clearer idea of the injury trends per worker. In terms of occupational injury rates (with respect to 2004), we observed increases in construction, financing & real estate (economic sectors), among engineers and technicians (occupations), in infections and secondary contusions (injury type), for upper and lower limbs (affected body parts), over falls and “other” causes. Most injuries occurred on Fridays, which is a weekend day in Saudi Arabia. We also observed increased recovery without disability (injury status). However, if we look at the number of occupational injuries per worker, we can see a decreasing trend over time for all occupations and economic sectors, most likely thanks to improved labour law and safety at work practices for insured workers. Our findings are similar to reports from other Persian Gulf countries and reflect current labour health and safety issues in the area.

**KEY WORDS:** construction workers; contusions; engineers; General Organization for Social Insurance; infections; labour; Persian Gulf countries; technicians

Around the world work-related diseases and occupational injuries have been estimated to cause 2.3 million deaths (2 and 0.3, respectively) every year with an economic cost between 1.8 and 6.0 % (average 4 %) of gross domestic product (1). Adding absenteeism and productivity decreases (2) to the unfortunate score gives an even better idea about the significance of occupational injury burden on the society (3, 4). In industrial countries, however, improved prevention and structural modifications have brought down this number of occupational injuries (5). The road towards this goal starts with the collection and analysis of occupational injury data (4, 6, 7). Arab countries seem to lag behind in this respect, most likely due to lack of awareness, regional data (7, 8), and analysis.

The Kingdom of Saudi Arabia (KSA) is a rapidly industrialising country with the ambition to minimise dependence on oil reserves in the future. Saudi labour market is flourishing with many businesses and a large workforce operating heavy machinery and equipment. Health and safety of workers are regulated by a legal framework and a number of governmental and non-governmental occupational health and safety organisations

(9), including the General Organization for Social Insurance (GOSI), a government agency for the implementation of social insurance laws with a board of directors who represent Saudi ministries of labour, finance, and health, employers, and qualified workers. GOSI collects fixed taxes to cover insurance for injured workers and their family members. Employers pay 2 % of worker salaries, which can be raised to 4 % if the employers do not meet occupational health and safety requirements set by GOSI.

According to Hämäläinen et al. (10), these efforts had produced a drop in occupational accidents in the KSA by 2003. The aim of our study was to see current trends based on a retrospective analysis of occupational injury data provided by GOSI for the years 2004 through 2016. To the best of our knowledge, this is the first comprehensive epidemiological study of occupational injuries on the national level.

## DATA AND METHODOLOGY

### *Data source and study population*

We used open data on occupational injuries from annual statistical reports issued by GOSI (<https://www.gosi.gov.sa>) for the years 2004 through 2016 and extracted them into Microsoft Excel datasheets according to the following

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criteria: injury recovery, cause of injuries, economic sector, occupation, injured body parts, nature of injury, and weekday. Records for the years between 2012 and 2016, however, lack info on types of injuries, injured body parts, and weekday.

Between 2004 and 2016, hundreds of thousands of registered establishments had employed from less than three million insured workers in 2004 to over ten million in 2016, most of whom were blue collar expats.

*Analysis*

To investigate epidemiological trends of occupational injuries/accidents in the KSA we relied on the index method used before for Turkey, Pakistan, and Saudi Arabia (11–13). The index for the year *Y* was calculated with respect to reference year using the following equation:

$$(N_y/N_{ref}) \times 100,$$

where  $N_y$  is the total number of occupational injuries in the year *Y*, and  $N_{ref}$  is the number of injuries in the reference year. Indices above 100 indicate increase. For example, index 125 means a 25 % increase in the total number of injuries compared to the reference year, while index 50 means a 50 % drop.

To see the trend per insured worker in a specific year, we also calculated injury-to-worker ratio ( $N_i/N_w$ ), where  $N_i$  stands for the total number of all or specific occupational injuries divided by the number of insured workers in a particular year.

We used the simple linear regression model to calculate the slope values of subcategories by considering number of years (*x*) as independent variable and percentage of occupational injuries (*y*) as dependent variable. Assuming a linear trend, positive value of slope indicates upward trend through years, while a negative slope value indicates a

downward trend. The equation for the slope of the regression line was

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2}$$

RESULTS

*Total occupational injuries and deaths*

Table 1 shows the number of establishments, insured workers, Saudi workers (SW), foreign workers (FW), occupational injuries (total and their distribution between SW and FW), and occupational deaths in the KSA between 2004 and 2016. A total of 6562 occupational deaths was recorded over the studied period, averaging 505 a year. Quite expectedly, occupational injuries were far more common among foreign workers than Saudi nationals (93.5 % vs 6.5 %, respectively) (Table 1), whose number increased over 300 % by 2016, but the annual number of injuries dropped by more than 40 % by that time (Figure 1).

*Distribution of occupational injuries by economic sectors*

Over the studied period, the highest percentage of occupational injuries was recorded in construction (46.5 %), followed by trade (23.8 %) and manufacturing (17.9 %). The share of occupational injuries in construction, financing & real estate, and mining & quarry increased over the years, while it decreased in trade, manufacturing, and social services. However, the injury-to-worker ratio ( $N_i/N_w$ ) decreased for all these economic sectors over the same period, as the number of injuries for each sector either

**Table 1** The distribution of establishments, insured workers, occupational deaths, and injuries in Saudi Arabia between 2004 and 2016

Year	TE	TIW	SW	FW	TOI	OISW	OIFW	TOD
2004	105462	2793757	571806	2221951	93521	6470	87051	320
2005	121554	3040134	654530	2385604	102259	7543	94716	493
2006	138002	3359566	723388	2636178	90853	7156	83697	437
2007	163764	3749575	753890	2995685	91822	7129	84693	506
2008	192685	4031146	765224	3265922	93285	6548	86737	646
2009	218363	4390447	790332	3600115	86211	5579	80632	587
2010	242561	4744134	838291	3905843	75487	4641	70846	507
2011	274034	5397485	1014889	4382596	75825	4357	71468	557
2012	335773	6985687	1279952	5705735	65656	3659	61997	351
2013	419485	9089891	1608238	7481653	52467	3005	49462	285
2014	396512	9386250	1565453	7820797	69241	3732	65509	856
2015	420941	10122477	1892812	8229665	67087	3082	64005	495
2016	453389	10489211	1875967	8613244	53404	2766	50638	522

TE – total establishments; TIW – total insured workers; SW – resident Saudi workers; FW – foreign workers; TOI – total occupational injuries; OISW – occupational injuries to resident Saudi workers; OIFW – occupational injuries to foreign workers; TOD – total occupational deaths

decreased or increased at a slower rate than the number of insured workers in the corresponding sector (Table 2).

*Distribution of occupational injuries by occupations*

The highest percentage of occupational injuries was recorded among service workers (45.2 %), followed by engineers (43.9 %) and technicians (4.5 %). Over the years, the share of injuries increased among engineers, technicians, and industrial, chemical & food workers, while it decreased among service workers and clerical & related workers (Table 3). As with economic sectors, the injury-to-worker ratio decreased for all occupations.

*Distribution of occupational injuries by type*

The most common types of occupational injuries between 2004 and 2011 were secondary contusions (33.1 %), cuts and punctures (23.5 %), twists and stretches (10.8 %), fractures and crushes (7.9 %), infections (4.3 %), and unspecified occupational injuries (16.0 %). Figure 4 shows occupational injury indices among insured workers by types of injuries. When we take 2004 as a reference year, the indices of all types of occupational injuries increased

by 2011, save for twists & stretches and unspecified injuries (Table 4).

*Occupational injuries by affected body parts*

Between 2004 and 2011, the distribution of occupational injuries by body part was as follows: non-classifiable (24.8 %), upper extremities (22.4 %), lower extremities (20.6 %), head (14.4 %), and trunk (12.8 %). Table 5 shows that the percentage of occupational injuries of upper and lower extremities increased over that period, but none of the indices showed a linear trend in either direction (Figure 5).

*Occupational injuries by cause*

The most common causes of occupational injuries were hits (35.8 %), falls (23.5 %), abrasions/frictions (16.5 %), allergic body reactions (9.8 %), and other causes (fire, hot liquid, drowning, suffocation, or poisoning) (6.0 %). The index of the last, unspecified causes reached 1371 % at the end of 2016, while other indices dropped (Figure 6). Similarly, injuries from falls and other causes showed a net percentage increase (Table 6).

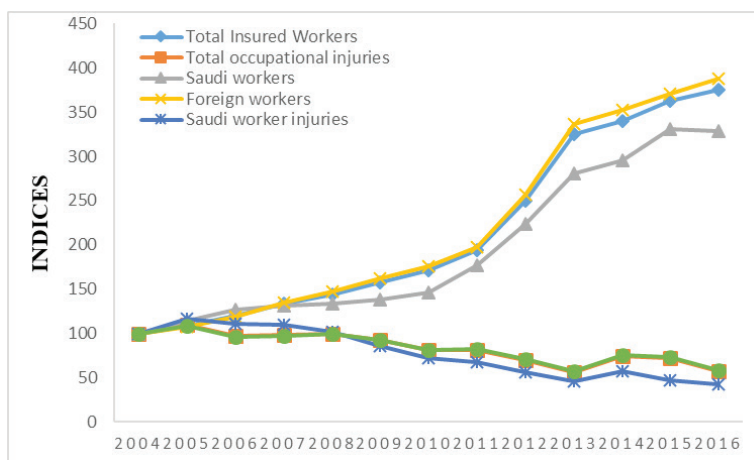


Figure 1 Trends in worker and occupational injury indices in Saudi Arabia between 2004 and 2016

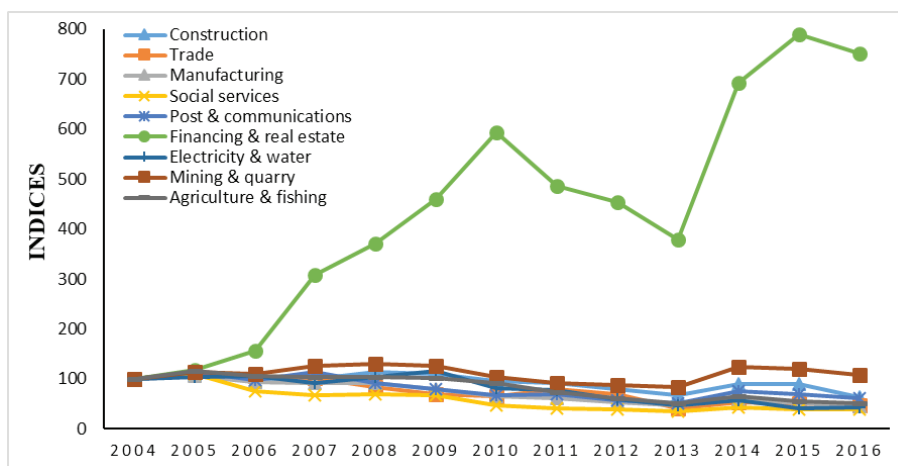


Figure 2 Trends in occupational injuries by economic sectors in Saudi Arabia between 2004 and 2016

**Table 2** Annual distribution of occupational injuries and injuries per worker (injury-to-worker ratio) by economic sectors in Saudi Arabia

Economic sector	Number of occupational injuries												
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Construction	39299 (42.0)	42326 (41.4)	37427 (41.2)	38929 (42.4)	44430 (47.6)	43308 (50.2)	37527 (49.7)	36367 (48.0)	31048 (47.3)	26700 (50.9)	35552 (51.3)	35587 (53.0)	24760 (46.4)
Trade	24680 (26.4)	28315 (27.7)	25946 (28.6)	25042 (27.3)	20766 (22.3)	16939 (19.6)	16028 (21.2)	19385 (25.6)	17275 (26.3)	10312 (19.7)	12948 (18.7)	12480 (18.6)	11471 (21.5)
Manufacturing	19303 (20.6)	20283 (19.8)	17892 (19.7)	17570 (19.1)	17741 (19.3)	15454 (17.9)	12714 (16.8)	11921 (15.7)	10103 (15.4)	9148 (17.4)	11400 (16.5)	9963 (14.9)	8589 (16.1)
Social services	4302 (4.6)	4686 (4.6)	3223 (3.5)	2927 (3.2)	2960 (3.2)	2885 (3.3)	2033 (2.7)	1789 (2.4)	1677 (2.6)	1511 (2.9)	1860 (2.7)	1661 (2.5)	1651 (3.1)
Post & communications	2202 (2.4)	2510 (2.5)	2150 (2.4)	2499 (2.7)	2014 (2.2)	1757 (2.0)	1502 (2.0)	1517 (2.0)	1243 (1.9)	1117 (2.1)	1673 (2.4)	1526 (2.3)	1365 (2.6)
Financing & real estate	449 (0.5)	527 (0.5)	698 (0.8)	1381 (1.5)	1662 (1.8)	2066 (2.4)	2661 (3.5)	2179 (2.9)	2034 (3.1)	1704 (3.2)	3112 (4.5)	3547 (5.3)	3376 (6.3)
Electricity & water	1392 (1.5)	1436 (1.4)	1460 (1.6)	1274 (1.4)	1454 (1.6)	1607 (1.9)	1147 (1.5)	1074 (1.4)	835 (1.3)	651 (1.2)	811 (1.2)	578 (0.9)	613 (1.1)
Mining & quarry	1077 (1.2)	1223 (1.2)	1190 (1.3)	1354 (1.5)	1410 (1.5)	1367 (1.6)	1129 (1.5)	985 (1.3)	941 (1.4)	906 (1.7)	1346 (1.9)	1301 (1.9)	1157 (2.2)
Agriculture & fishing	817 (0.9)	953 (0.9)	867 (1.0)	846 (0.9)	848 (0.9)	828 (1.0)	746 (1.0)	608 (0.8)	500 (0.8)	418 (0.8)	539 (0.8)	444 (0.7)	422 (0.8)
	Number of injuries per worker												
	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>	N/N <sub>w</sub>
Construction	0.047	0.046	0.035	0.031	0.031	0.027	0.021	0.017	0.010	0.007	0.009	0.008	0.006
Trade	0.026	0.027	0.023	0.021	0.018	0.014	0.013	0.015	0.010	0.004	0.006	0.005	0.005
Manufacturing	0.062	0.060	0.049	0.043	0.038	0.030	0.023	0.020	0.013	0.010	0.012	0.010	0.008
Social services	0.012	0.012	0.008	0.007	0.007	0.007	0.004	0.004	0.003	0.002	0.002	0.002	0.002
Post & communications	0.028	0.031	0.024	0.020	0.016	0.013	0.010	0.009	0.006	0.004	0.005	0.004	0.004
Financing & real estate	0.006	0.006	0.006	0.009	0.008	0.008	0.009	0.006	0.004	0.002	0.004	0.004	0.004
Electricity & water	0.025	0.026	0.025	0.020	0.021	0.022	0.015	0.013	0.010	0.006	0.007	0.005	0.005
Mining & quarry	0.014	0.016	0.014	0.014	0.014	0.013	0.010	0.008	0.007	0.005	0.007	0.007	0.006
Agriculture & fishing	0.020	0.023	0.020	0.017	0.015	0.014	0.013	0.010	0.006	0.005	0.005	0.004	0.004

N – number of injuries; N/N<sub>w</sub> – number of injuries per worker (injury-to-worker ratio)

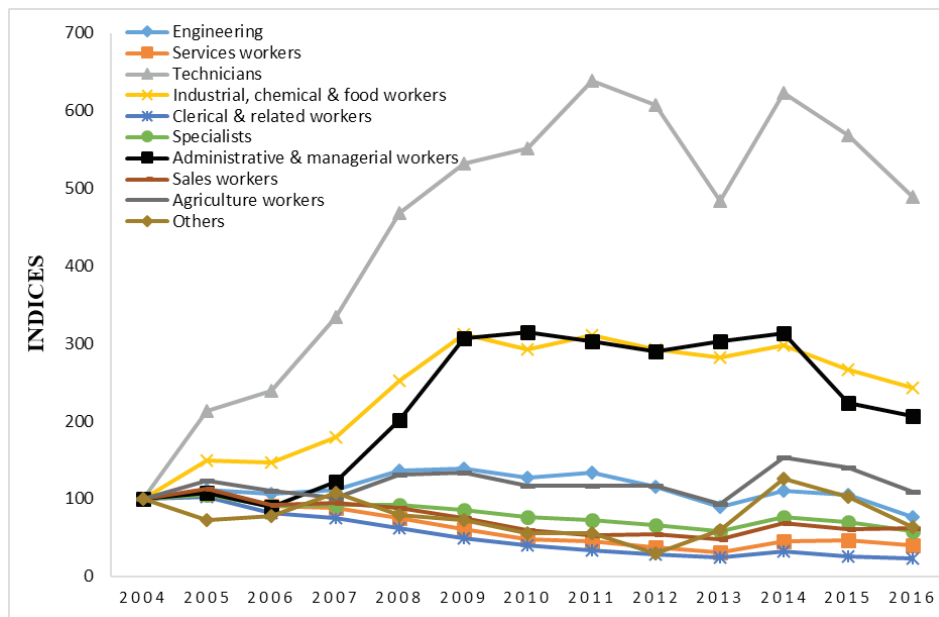


Figure 3 Trends in occupational injuries by occupations in Saudi Arabia between 2004 and 2016

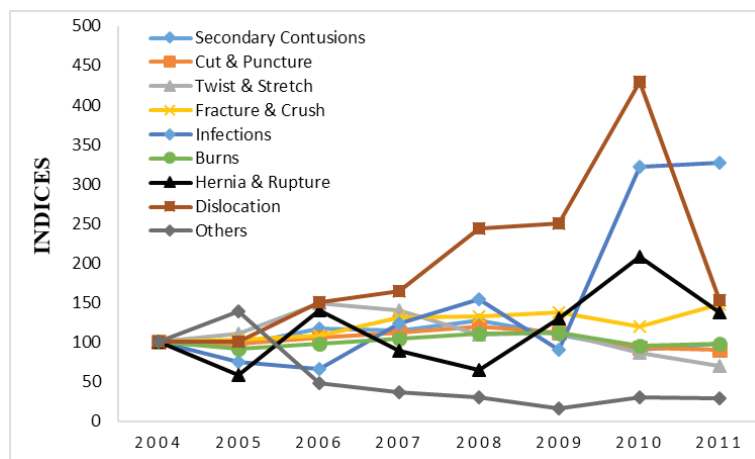


Figure 4 Trends in occupational injuries by type in Saudi Arabia between 2004 and 2011

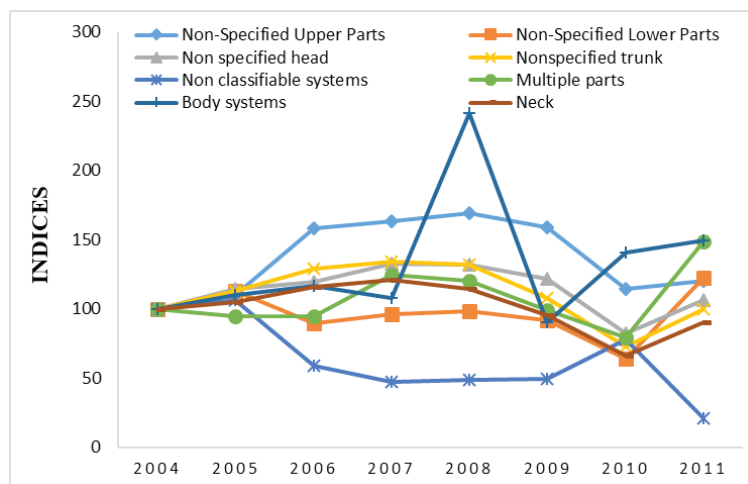


Figure 5 Trends in occupational injuries by injured body part in Saudi Arabia between 2004 and 2011

**Table 3** Annual distribution of occupational injuries, workers and number of injuries per workers (injury-to-worker ratio) by occupations in Saudi Arabia

Occupations	Number of occupational injuries												
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Engineering	30615 (32.7)	34131 (33.4)	32421 (35.7)	34281 (37.3)	41566 (44.6)	42306 (49.1)	39106 (51.8)	40726 (53.7)	35214 (53.6)	27271 (52.0)	33726 (48.7)	31938 (47.6)	23234 (43.5)
Services workers	56627 (60.6)	60417 (59.1)	51369 (56.5)	49569 (54.0)	42453 (45.5)	34118 (39.6)	27102 (35.9)	25257 (33.3)	21220 (32.3)	17229 (32.8)	25491 (36.8)	26224 (39.1)	22388 (41.9)
Technicians	776 (0.8)	1653 (1.6)	1854 (2.0)	2594 (2.8)	3636 (3.9)	4131 (4.8)	4279 (5.7)	4955 (6.5)	4710 (7.2)	3753 (7.2)	4833 (7.0)	4412 (6.6)	3794 (7.1)
Industrial, chemical & food workers	669 (0.7)	1000 (1.0)	978 (1.1)	1199 (1.3)	1682 (1.8)	2087 (2.4)	1958 (2.6)	2077 (2.7)	1960 (3.0)	1886 (3.6)	1989 (2.9)	1779 (2.7)	1625 (3.0)
Clerical & related workers	2185 (2.3)	2234 (2.2)	1787 (2.0)	1635 (1.8)	1361 (1.5)	1061 (1.2)	877 (1.2)	721 (1.0)	617 (0.9)	535 (1.0)	686 (1.0)	555 (0.8)	496 (0.9)
Specialists	1282 (1.4)	1343 (1.3)	1169 (1.3)	1176 (1.3)	1175 (1.3)	1092 (1.3)	978 (1.3)	934 (1.2)	842 (1.3)	739 (1.4)	985 (1.4)	891 (1.3)	749 (1.4)
Administrative & managerial workers	103 (0.1)	111 (0.1)	92 (0.1)	125 (0.1)	207 (0.2)	316 (0.4)	324 (0.4)	312 (0.4)	298 (0.5)	312 (0.6)	323 (0.5)	230 (0.3)	213 (0.4)
Sales workers	793 (0.8)	897 (0.9)	732 (0.8)	751 (0.8)	698 (0.7)	599 (0.7)	469 (0.6)	421 (0.6)	428 (0.7)	374 (0.7)	544 (0.8)	477 (0.7)	490 (0.9)
Agriculture workers	261 (0.3)	322 (0.3)	289 (0.3)	265 (0.4)	342 (0.4)	350 (0.4)	305 (0.4)	306 (0.4)	305 (0.5)	244 (0.5)	399 (0.6)	365 (0.5)	283 (0.5)
Others	210 (0.2)	151 (0.1)	162 (0.2)	227 (0.2)	165 (0.2)	151 (0.2)	89 (0.1)	116 (0.2)	62 (0.1)	124 (0.2)	265 (0.4)	216 (0.3)	132 (0.2)
Number of injuries per worker													
Occupations	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Engineering	0.048	0.048	0.042	0.036	0.036	0.032	0.026	0.023	0.015	0.009	0.012	0.011	0.008
Services workers	0.035	0.035	0.027	0.025	0.022	0.017	0.013	0.012	0.008	0.005	0.007	0.007	0.005
Technicians	0.009	0.015	0.014	0.015	0.017	0.016	0.014	0.013	0.010	0.006	0.007	0.006	0.005
Industrial, chemical & food workers	0.016	0.020	0.017	0.016	0.018	0.019	0.015	0.013	0.009	0.007	0.008	0.008	0.007
Clerical & related workers	0.011	0.010	0.008	0.007	0.006	0.004	0.003	0.002	0.001	0.001	0.001	0.001	0.001
Specialists	0.012	0.012	0.009	0.008	0.007	0.006	0.004	0.004	0.003	0.002	0.003	0.002	0.002
Administrative & managerial workers	0.005	0.005	0.004	0.004	0.005	0.006	0.005	0.003	0.002	0.002	0.002	0.001	0.001
Sales workers	0.009	0.009	0.007	0.006	0.005	0.004	0.003	0.002	0.002	0.001	0.001	0.001	0.001
Agriculture workers	0.021	0.021	0.016	0.012	0.013	0.011	0.008	0.006	0.004	0.002	0.003	0.003	0.003
Others	5.385	0.045	0.024	0.023	0.011	0.009	0.004	0.005	0.002	0.001	0.001	0.001	0.001

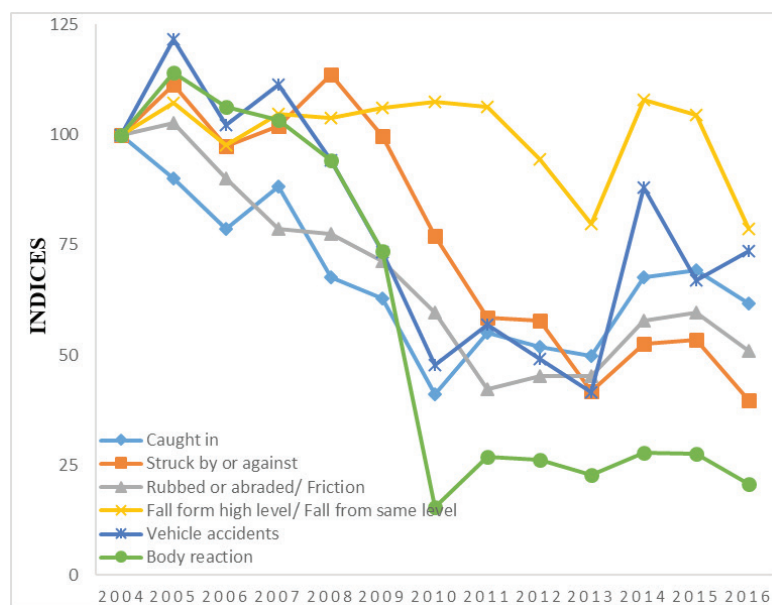
N – number of injuries;  $N/N_w$  – number of injuries per worker (injury-to-worker ratio)

**Table 4** Distribution of occupational injuries by type in Saudi Arabia between 2004 and 2011, expressed in percentages

Type of occupational injuries	2004	2005	2006	2007	2008	2009	2010	2011	Slope
Secondary contusions	29.1	25.9	35.5	35.1	38.3	37.3	31.3	34.0	0.8
Cut & puncture	21.3	19.0	23.3	24.9	26.3	27.7	23.5	22.9	0.6
Twist & stretch	9.3	9.4	14.3	13.6	10.5	12.1	9.5	7.6	-0.2
Fracture & crush	6.0	5.7	6.8	8.3	8.3	9.6	8.6	10.6	0.7
Infections	2.6	1.8	1.8	3.3	4.1	2.7	9.9	10.0	1.1
Burns	1.8	1.5	1.8	2.0	2.1	2.4	2.1	2.1	0.1
Hernia & rupture	1.5	0.8	2.3	1.4	1.0	2.3	3.8	2.5	0.3
Dislocation	0.2	0.2	0.4	0.4	0.6	0.7	1.2	0.4	0.1
Unspecified	28.2	35.7	13.9	10.8	8.7	5.2	10.1	9.9	-3.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	0.8

**Table 5** Distribution of occupational injuries by injured body parts in Saudi Arabia between 2004 and 2011, expressed in percentages

Injured body parts	2004	2005	2006	2007	2008	2009	2010	2011	Slope
Upper limbs	15.5	15.6	25.3	25.8	26.3	26.7	21.9	23.0	1.1
Lower limbs	20.2	20.8	18.6	19.8	19.9	20.1	16.0	30.5	0.6
Head	12.0	12.6	14.8	16.2	15.9	15.9	12.3	15.8	0.3
Trunk	10.9	11.3	14.5	14.9	14.5	12.8	9.8	13.4	0.1
Non-classifiable	37.0	35.9	22.4	17.8	18.0	19.9	35.6	9.6	-2.4
Multiple parts	3.7	3.2	3.6	4.7	4.4	4.0	3.6	6.7	0.3
Body systems	0.3	0.3	0.3	0.3	0.6	0.3	0.4	0.5	0.0
Neck	0.4	0.4	0.5	0.5	0.4	0.4	0.3	0.4	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	

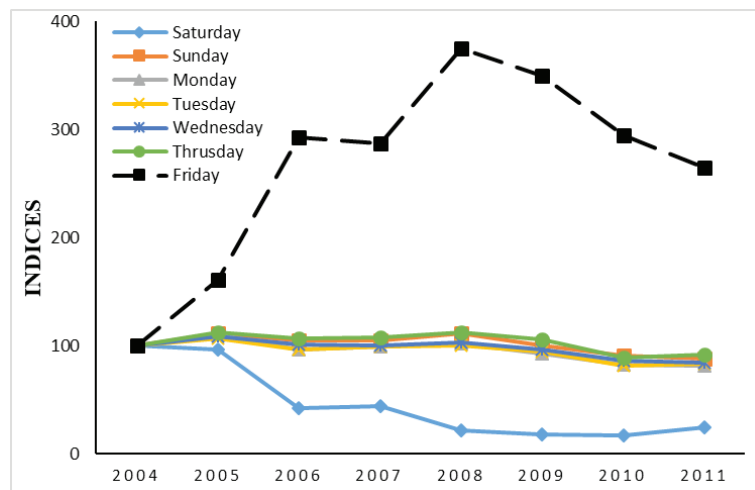


**Figure 6** Trends in occupational injuries by causes in Saudi Arabia between 2004 and 2016









**Figure 8** Trends in occupational injuries by day of the week in Saudi Arabia between 2004 and 2011

office safety policies. This increase may also challenge the traditional notion of white collar workers (administrative jobs) as safe in developing countries, but only specific further investigation will be able to provide some answers.

Similar to a report from Qatar (14), the most common cause of occupational injuries were blows, followed by falls and abrasions. However, what caught our attention the most is the increasing trend in unspecified occupational injuries, also reported by Bakhtiyari et al. for Iran (15). It may be owed to a classification system that does not bother to detail what may be important information about the epidemiological aspects of occupational injuries. Whatever the reason, this issue calls for more attention. In contrast, we observed a consistent drop in “allergic body reactions”, which may point to lower exposure to allergens at work.

The increased trend in secondary contusions, cuts & punctures, fractures & crushes, and dislocations may be associated with the intensified use of machinery and tools in industrial and construction settings.

As for the distribution of injuries by body parts, our findings about an increasing trend in injuries of the upper extremities is in agreement with the findings in Oman (16), but not with the report by Al-Thani et al. (14) for Qatar, which singles out lower extremities as the most frequently injured body parts.

The share of injuries still under treatment has decreased in our study, which is likely owed to improved medical treatment, whereas injuries resulting in disability have been consistent.

One of the interesting findings is that most of the occupational injuries occurred on Friday and the fewest on Saturday. The reader should be aware of the cultural differences in the work week between Middle Eastern and Western countries. In Saudi Arabia, weekends start with Thursday and end with Saturday, whereas in the Western countries they start with Friday afternoons and end with Sundays. A study from the USA (20) reporting the highest rate (37 %) of occupational injuries on Sundays may therefore point to a similar social behaviour on weekends,

despite cultural differences. It looks as though workers relax most and sleep the least on the central weekend days, which are from Thursday to Friday in the Middle East and from Saturday to Sunday in the West.

## CONCLUSION

In conclusion, the decrease in occupational injury indices and in the  $N_i/N_w$  ratios seem to point to improved safety at work and to a similar pattern with other neighbouring countries with the high share of foreign, mostly blue collar workforce. This study, however, has a number of limitations stemming from the limitations of the GOSI database, which does not distinguish age groups of insured workers, loss of working hours against occupational injuries, or medical cost due to occupational injuries. It also does not include uninsured workers. Furthermore, a number of injuries have not been specified in the database as to the type, cause, and body part affected, and the period between 2012 and 2016 has not been as specific as the rest in terms of incidence by day of the week, type of injury, and body part affected. Even so, it is the first comprehensive insight into the trends, which calls for further investigation and improvement of the database on the national level.

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### Conflict of interest

None to declare. This study has been done independent of the data provider GOSI.

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## Epidemiologija ozljeda na radu među osiguranim radnicima u Saudijskoj Arabiji od 2004. do 2016.

Retrospektivno smo analizirali godišnja izvješća o ozljedama na radu od 2004. do 2016., koje objavljuje državna agencija za socijalno osiguranje Kraljevine Saudijske Arabije. Za svaki smo kriterij izračunali odgovarajući indeks pomoću jednadžbe  $N_y/N_{ref} \times 100$ , gdje  $N_y$  označava broj ozljeda na radu prema specifičnom kriteriju u pojedinoj godini  $Y$ , a  $N_{ref}$  broj ozljeda u odgovarajućem kriteriju zabilježen u 2004., koja je uzeta kao referentna godina. Također smo izračunali omjer ozljeda i registriranih radnika ( $N_y/N_w$ ) za različita zanimanja i gospodarske sektore kako bismo dobili jasniju sliku trenda ozljeda po radniku. Primijetili smo porast učestalosti ozljeda na radu (u odnosu na 2004.) u građevinskom i financijskom/nekretnosnom sektoru, među inženjerima i tehničarima, u broju infekcija i sekundarnih kontuzija, u broju ozljeda gornjih i donjih udova, s uzrocima koji su najviše kategorizirani kao "ostali". Većina se ozljeda dogodila petkom, koji je dan vikenda u Saudijskoj Arabiji. Također smo primijetili veću učestalost oporavka bez invaliditeta (status ozljede). No kad se pogleda broj ozljeda na radu po radniku, primjećuje se padajući trend za sva zanimanja i sve gospodarske sektore, ponajviše, vjerujemo, zbog poboljšanja zakonskih odredbi o radu i sigurnijoj praksi kod osiguranih radnika. Naši rezultati slični su onima iz drugih zemalja Perzijskoga zaljeva te odražavaju trenutačne probleme vezane uz zdravlje i sigurnost radnika.

**KLJUČNE RIJEČI:** Generalna organizacija socijalnog osiguranja; građevinski radnici; infekcije; inženjeri; kontuzije; rad; tehničari; zemlje Perzijskoga zaljeva