

Injuries in Airport Workers

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Specific Aim/Hypothesis

- Find a trend of injuries based on the analysis of workers compensation claims

Hypothesis

- Different body parts cost different amount for compensations → draw a trend of injuries (body parts with the most claims/injuries) → plan interventions in work routines or adjustment in work tasks involving those areas → injury reduction → healthier work conditions & saved company money



Background

- Airline industry is fast-paced and demanding
- Challenging work conditions
 - Needle stick injuries
 - Noise exposure
 - Extreme weather conditions
 - Airborne particles
 - Repetitive and awkward movements
- In 2013, non-fatal injuries = 7.5 per 100 FTE > all industries (3.5 per 100 FTE)
- Fatal rate for aircraft pilots and flight engineers = 50.6 per 100,000 full-time equivalent workers → 3rd highest worker fatal injury rate in 2013

Fatalities and non-fatal injuries in airport workers



Data series	2010	2011	2012	2013
Fatalities				
Number of fatalities	32	29	33	24
Rate of injury and illness cases per 100 full-time workers				
Total recordable cases	8.1	7.3	7.4	7.5
Cases involving days away from work, job restriction, or transfer	6.3	5.5	5.5	5.5
Cases involving days away from work	4.6	4.3	4.3	4.2
Cases involving days of job transfer or restriction	1.7	1.2	1.2	1.4

Incidence rates of nonfatal injuries of all industries	3.8	3.8	3.7	3.5
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How workers died in multiple-fatality incidents, 2013

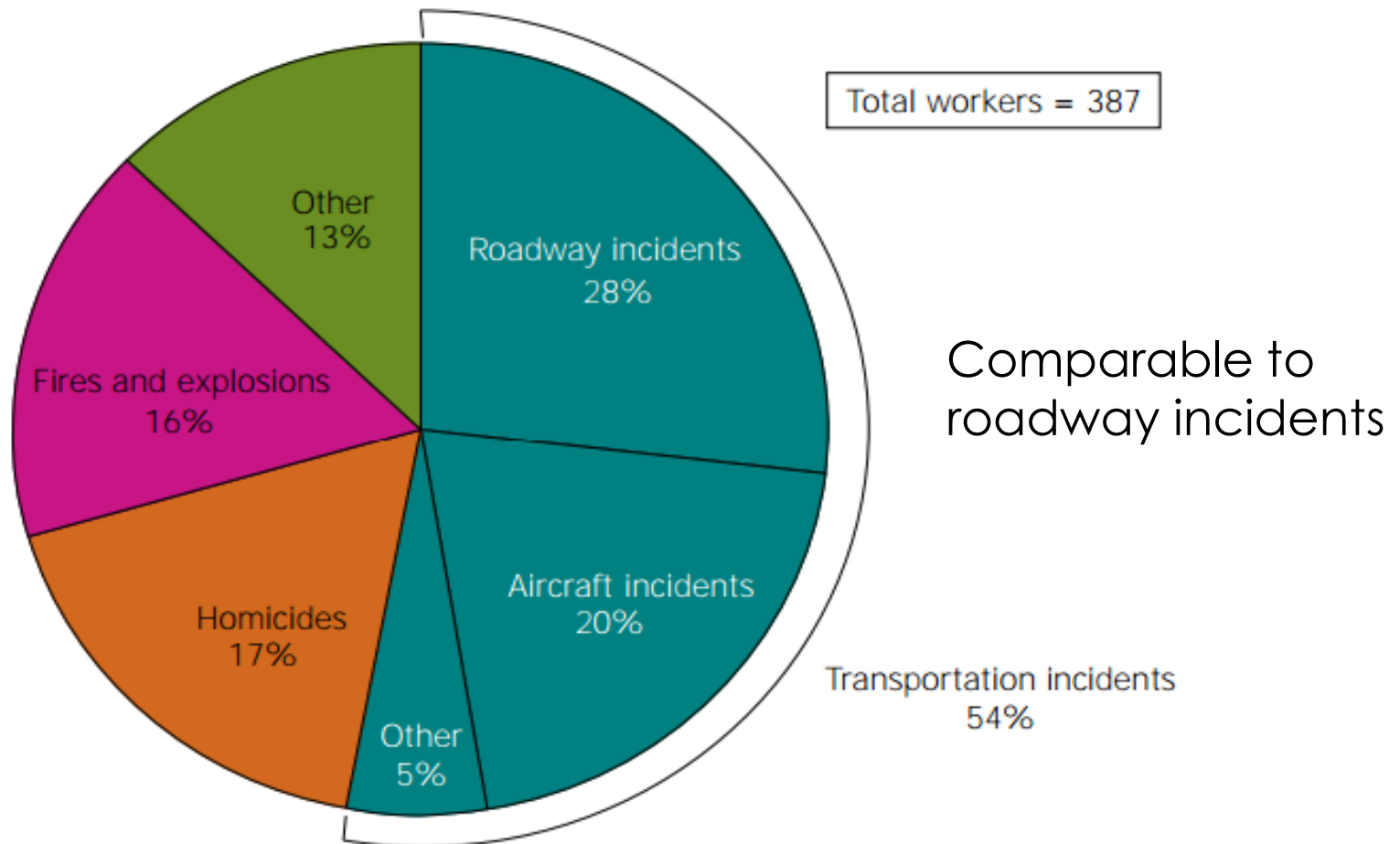


Image source: <http://www.bls.gov/iif/oshwc/foi/cfch0012.pdf>

Methods

- Workers compensation database
- Cases filed between 2005-2013
- 5 airlines: American Airlines, United Airlines, Southwest Airlines, Air Canada, Korean Air
- Variables:
 - Demographics: age group, gender, # of dependents, marital status
 - Injury-related: types of injury, injured body parts
 - Compensations: total temporary total disability (total TTD), total permanent partial disability (total PPD), total compensations, average weekly wage, days of accident-to-filing, days of accident-to-decision, days of filing-to-decision, use of representatives
- SAS enterprise for descriptive analysis & Quantreg model for multivariable analysis

Results: Demographics

Category	Counts (N)	Percent
Gender		
Male	4380	48.21%
Female	4695	51.67%
Unspecified	11	0.12%
Claim Representative		
Not using attorney	472	5.29%
Using Attorney	8446	94.71%
Unspecified	168	1.85%
Claims with Decision Involving Monetary Compensation	6854	68.35%
Age at the Time of Accident (years old)		
35 to 44 (avg = 41.45)	2690	26.82%
45 to 54 (avg = 50.53)	3679	36.68%
55 to 64 (avg = 59.42)	1871	18.66%

- Equal distribution w/ gender
- Majority use legal representatives
- 45-54 is the largest age group

Trends of Compensations



Accident Year	Total Temporary Total Disability (weeks)		Total Permanent Partial Disability		Total Workers Compensation (USD)		Average Weekly Wage (USD)		IWCC Claims by Filing Year	IWCC Claims by Accident Year
	Mean	Median	Mean	Median	Mean	Median	Mean	Median		
2005	5.36	2.69	16.97	13.04	\$34,197.08	\$19,075.44	\$813.59	\$788.00	1108 (11.05%)	1114 (11.11%)
2006	4.95	2.64	17.72	12.50	\$34,716.77	\$16,265.61	\$794.51	\$778.13	1156 (11.53%)	1249 (12.45%)
2007	4.58	2.36	16.63	11.76	\$27,905.45	\$16,402.00	\$776.45	\$781.67	1394 (13.9%)	1266 (12.62%)
2008	4.06	2.43	16.63	11.89	\$25,295.23	\$15,915.23	\$785.51	\$777.68	1346 (13.42%)	1247 (12.43%)
2009	4.00	2.34	17.54	11.20	\$27,571.69	\$16,792.84	\$827.54	\$803.98	1205 (12.02%)	1055 (10.52%)
2010	3.43	2.50	20.53	12.50	\$35,678.84	\$15,836.78	\$857.82	\$838.86	1080 (10.77%)	1005 (10.02%)
2011	2.61	1.91	38.13	16.44	\$22,062.63	\$15,127.88	\$876.04	\$847.19	988 (9.85%)	863 (8.61%)
2012	1.93	1.37	79.89	100.00	\$17,302.99	\$11,448.10	\$920.09	\$857.20	880 (8.77%)	768 (7.66%)
2013	1.00	0.90	7.38	5.00	\$12,438.91	\$8,453.70	\$950.83	\$880.00	872 (8.69%)	519 (5.17%)

Decreasing

Increasing

Multivariable Analysis



Parameter	Estimate	Standard Error	95% Confidence Limits		t Value	Pr > t
Intercept	-7706.61	943.0216	-9555.264	-5857.949	-8.17	<.0001
AdjCPIAvgWeekWage	9.0864	0.7606	7.5954	10.5774	11.95	<.0001
TotalTTDWeeks	2475.998	128.2672	2224.548 4	2727.4468	19.3	<.0001
POBlowextremfinal	-1222.78	359.1097	-1926.763	-518.7981	-3.41	0.0007
POBupextremfinal	-304.591	369.1904	-1028.336	419.1531	-0.83	0.4094
UsedAttorney	3486.707	495.9347	2514.498 3	4458.9147	7.03	<.0001
Male	64.4624	303.8999	-531.2894	660.2142	0.21	0.832
FilingAgeYrs	104.7553	14.0513	77.2097	132.3008	7.46	<.0001
TotalPPDpercby100NoZ	267.5391	20.4597	227.4308	307.6475	13.08	<.0001
NumDependents	-41.6783	83.7635	-205.8845	122.5279	-0.5	0.6188

Compensations for body parts



	N	%	Median Total Monetary Compensation (USD)*	Median Temporary Total Disability (TTD) (Weeks)	Median Permanent Partial Disability (PPD) (Percent)
Body Part Injured					
Head, Neck, and Face	710	7.81%	\$13,276.49	2.2	8.00%
Back and Spine	1868	20.55%	\$14,723.97	2.4	7.50%
Torso	136	1.49%	\$8,057.94	0.9	3.10%
Upper Extremities	3180	35.00%	\$20,010.59	3.0	20.00%
Lower Extremities	2207	24.29%	\$16,720.37	2.2	20.00%
Systemic	753	8.29%	\$12,499.30	1.8	7.00%
Multiple Body Parts / Unspecified	7903	86.98%	\$15,658.50	2.4	14.00%

- Upper extremities are the highest pay with the most weeks-off
- Majority of injured body parts is not specified
- Sprain/strain (5.85%), ruptured hernia/herniated disc (2.45%), fracture (2.05%)

Discussion

- Decreasing total TTD & Total TWC → less injuries?
- Most expensive body parts: upper extremities, lower extremities, back & spine
- Minor injuries in recent years, affecting unimportant parts
- Sprain/strain, herniated disc, and fracture → ergonomic issues?

Limitations

- Incomplete/unclear reports on types of injury and injured body parts
- Lag time in developing illnesses
- Various pending periods of claims' approval
- Unreported illnesses (not severed, maybe unrelated to work, etc.)



Summary

- High injury rates in sprain/strain, herniated disc and fracture
- Body parts with highest claims: upper extremities, lower extremities, back & spine
- Fatalities: cause of death is not reported
- Accident types: caught in structure/vehicle, struck by

Interventions

- Address ergonomic issues, vehicle safety,





Image source: <http://www.airport-ergonomics.com/baggage-handling-systems.html>

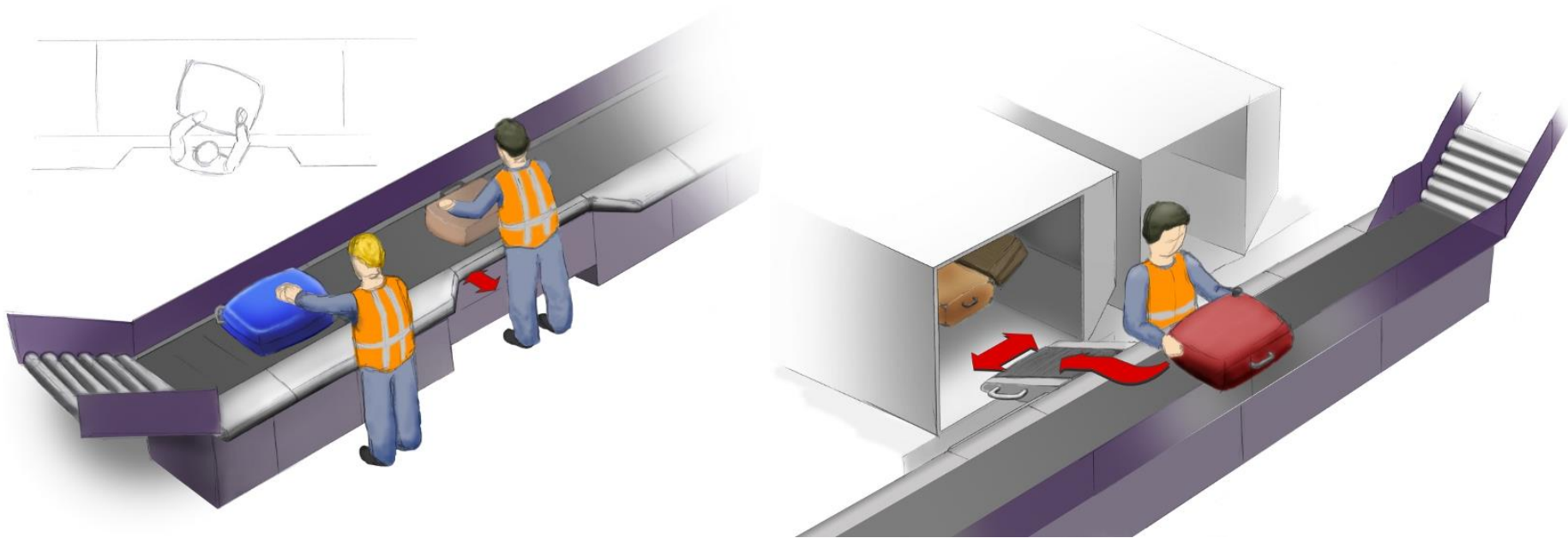


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Questions?

