

Epidemiology of drowning and near drowning at Karachi beaches from 2012 to 2014

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Abstract

Karachi Municipal Corporation's Emergency Response Center's lifeguards save drowning individuals, recover dead bodies of drowned individuals, and provide first aid care to injured victims of near-drowning and road traffic accidents on the road along the various beaches. Cumulatively 302 drowning and near-drowning incidents were recorded from 2012 to 2014, with 291 (96.3%) incidents involving males. One hundred ninety-six (64.9%) individuals were saved from drowning, out of which 116 (59.2%) were saved on Sundays, followed by 31 (15.8%) on Saturdays; with 79 (40.3%) being saved during the hours 06:00 PM to 07:59 PM. Out of total 34 dead bodies were recovered, Sundays registered 8 (23.5%) such incidents. Out of the 72 individuals who received first-aid care, 60 (83.3%) received it on Sundays and Saturdays. The months of April, May, and June were the peak months of incidents for saving from drowning. Results augur the need for targeted health education campaigns, especially during summer months.

Keywords: Drowning, Injuries, Karachi.

Introduction

Globally, drowning is responsible for 372,000 deaths annually, with over 90% of such deaths being reported from low and middle income countries like Pakistan.¹ In United States, there were 3,380 deaths due to drowning, on average, from 2005 to 2009.² A cross-sectional survey conducted in September 2007 on childhood injuries in the Mastung district in Balochistan and Tandojam district in Sindh provinces reported only one drowning fatality.³ Another study on injuries among children, based on emergency medical transportation provider data from October 1993 to January 1996 in Karachi reported a total of 1,320 cases of injuries in children 15 years or under, and reported that drowning was responsible for 3% of injuries.⁴

Karachi is the only maritime metropolis of Pakistan with the Arabian Sea beach lining its southern coastline. There

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are no studies on drowning and near drowning incidents at the beaches of Karachi. This preliminary study was done to assess the epidemiologic profile of drowning incidents recorded by the Emergency Response Center at the beaches of Karachi.

Methods and Results

Karachi Municipal Corporation's Emergency Response Center (ERC) located at Hawks Bay, run by the Fire Department, employs lifeguards who man the beaches and watch towers. These lifeguards rescue and save lives of drowning individuals, as well as recover the bodies of people who have drowned, in addition to providing first aid care to injured victims of near drowning and road traffic accidents on the road along the various beaches. ERC maintains a paper-based registry at Hawks Bay which records all the instances where either anyone was saved from drowning, recovery of dead bodies at various beaches around Hawks Bay, and first aid care provision at ERC.

In January 2015, all the registers marked for the years 2012 to 2014 were retrieved and studied at Hawks Bay ERC in Karachi; pertinent information was extracted and recorded in an electronic spreadsheet file. Subsequently these data were entered in STATA V.13, and analyzed for various indices, in terms of frequencies, percentages, and means.

Table 1 provides information on the number and type of incidents recorded i.e. saved, dead body recovery by site,

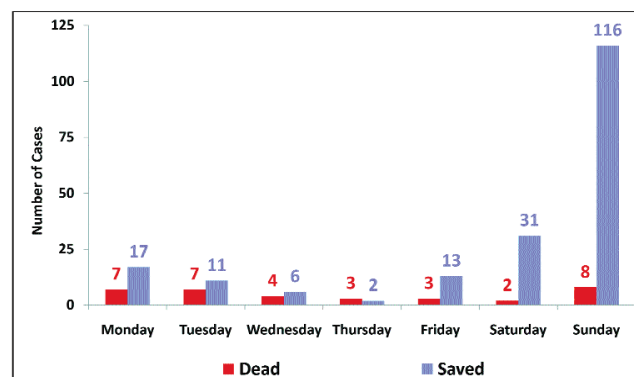


Figure-1: Cumulative number of individuals saved from drowning and dead bodies recovered, disaggregated by week day.

Table-1: Type of incident at various beaches in Karachi, by location and year.

Beach Site/Incident	2012 (N = 47)	2013 (N = 75)	2014 (N = 180)
Cape Mount			
Saved from drowning	0	0	1
Dead body recovered	0	0	2
Hawks Bay			
Saved from drowning	3	8	10
Dead body recovered	0	1	5
Kanup Point			
Saved from drowning	5	9	4
Dead body recovered	6	0	1
Neelam Point			
Saved from drowning	5	4	20
Dead body recovered	1	3	0
Paradise Point			
Saved from drowning	2	14	84
Dead body recovered	0	0	1
Sands Pit			
Saved from drowning	0	3	0
Dead body recovered	3	0	2
Sohnara Point			
Saved from drowning	0	4	20
Dead body recovered	1	1	1
Other Sites			
Saved from drowning	0	0	0
Dead body recovered	1	1	4
Total			
Saved from drowning	15*	42*	139*
Dead body recovered	12**	6**	16**
Emergency Response Center			
First Aid care provided for road accident injuries	20	27	25

* Out of the total 302 incidents recorded, 196 were saved while 106 were drowned.

** Not all bodies of drowned victims were recovered or recorded.

and first aid treatment provided at the ERC, disaggregated by year. Cumulatively 302 incidents of drowning and near drowning were recorded from 2012 to 2014, with 291 (96.3%) incidents involving males; information about age was missing for 90 (29.8%) records. Out of the total 302 incidents, 180 (59.6%) were recorded in the year 2014. Cumulatively, one hundred ninety-six (64.9%) individuals were saved from drowning, with 187 (95.4%) males. The mean age of individuals saved from drowning was 19.9±7.3 years; with 7 (3.6%) children aged 5 years or under, and 34 (17.3%) aged 15 years or under. However for 55 (28.1%) individuals, age information was not available. Seventy-two (23.8%) individuals were provided first aid care at the ERC, with 71 (98.6%) males. The mean age of these individuals was 24.8±12.9 years. There were 10 (13.9%) individuals who were aged 15 or under. However, for 15 (20.8%) individuals, age information was not available. There were 34 (11.3%) incidents where dead

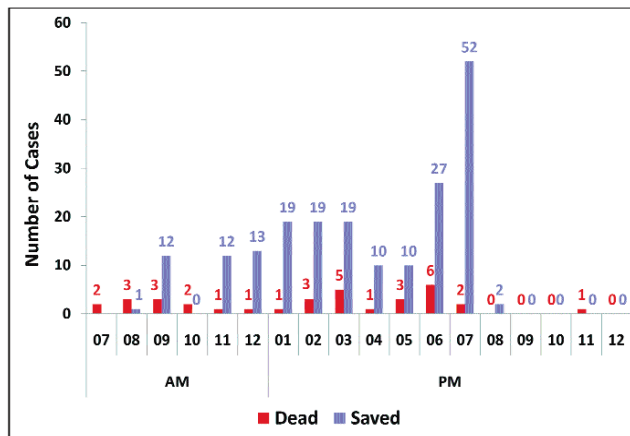


Figure-2: Cumulative number of individuals saved from drowning and dead bodies recovered, disaggregated by hour from 07 AM to 08 PM.

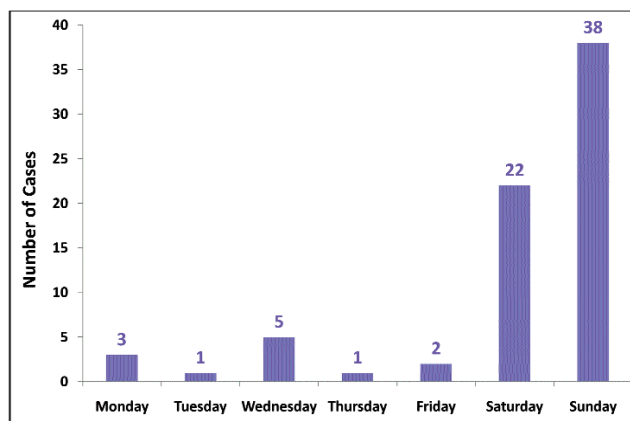


Figure-3: Cumulative number of individuals provided first aid care at Emergency Response Center, disaggregated by week day.

bodies were recovered, with 33 (97.1%) males; age information was missing for 20 (58.8%) of them. The remaining 72 bodies were either swallowed by the sea, washed ashore at other beaches or were retrieved but not recorded.

Figure-1 depicts the number of individuals who were saved from drowning and number of dead bodies recovered, disaggregated by the day of week from 2012 to 2014. Out of the total 196 individuals who were saved from drowning, 116 (59.2%) were saved on Sundays, followed by 31 (15.8%) on Saturdays. Out of total 34 dead bodies recovered, Sundays registered 8 (23.5%) such incidents, while Mondays and Tuesdays registered 7 (20.6%) each. Figure 2 depicts the number of individuals saved from drowning and number of dead bodies recovered by the hour of day i.e. from 07 AM to 12 PM (midnight) in the years 2012 to 2014. Out of the total 196

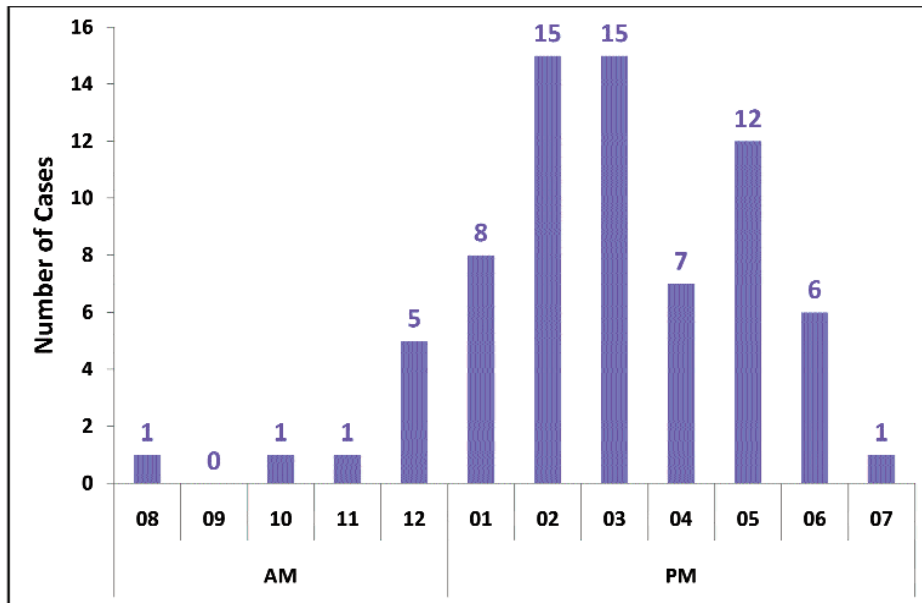


Figure-4: Cumulative number of individuals provided first aid care at Emergency Response Center, disaggregated by hour from 08 AM to 07 PM.

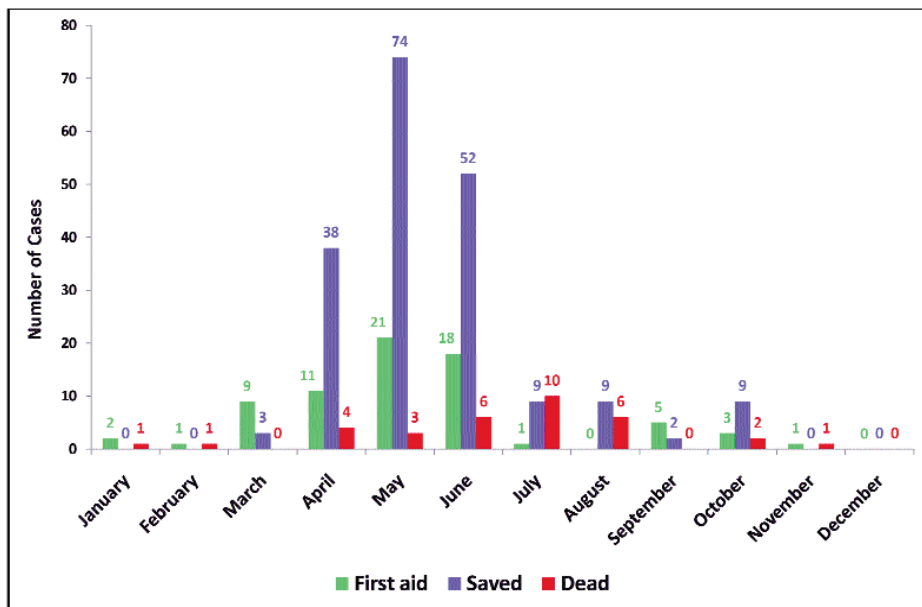


Figure-5: Cumulative number of incidents, disaggregated by month.

individuals who were saved from drowning, 79 (40.3%) were saved during the hours 06:00 PM to 07:59 PM. Figure 3 depicts the number of individuals who received first aid care at the Hawks Bay ERC, disaggregated by the day of week from 2012 to 2014. Out of the 72 individuals who received this care, 60 (83.3%) received it on Sundays and Saturdays. Figure 4 depicts the number of individuals who

received first aid care at ERC, disaggregated by the hour of day i.e. 08 AM to 07 PM from 2012 to 2014. Out of the 72 individuals having received such care, 30 (41.7%) individuals received it during the hours 02:00 PM to 03:59 PM. Figure 5 depicts the number of incidents disaggregated by months. The months of April, May, and June were the peak months of incidents for provision of first aid and saving from drowning; 50 (69.4%) individuals having received first aid, and 164 (83.7%) were saved from drowning in these three months. While June, July, and August were the peak months for recovery of dead bodies; with 22 (64.7%) recovered in these three months.

Discussion

The Emergency Response Center's (ERC) data show a substantial increase in the incidents from 2012 to 2014. This most likely suggests improvement in the recording of events in the 2014 year, rather than an actual increase in the number of incidents. The magnitude of increase in number of recorded incidents in the year 2014 cannot be attributed to an increase in the number of beach visitors. The plausible explanation would be limitation of administrative record keeping in the years 2012 to 2013; that was addressed in the year 2014. This impression was also reinforced after informal discussions with the ERC personnel, including lifeguards. Secondly it could also be an artifact owing to some missing registers, or due to simply having missed some of the pertinent information in the accessed registers; as these registers record lots of additional information like breakdown/repair of vehicles etc. As previously reported, lifeguards at ERC do not always record or report every single incident of saving someone from drowning; this issue of incomplete

reporting is also influenced by the fact that some individuals, having been rescued, tend to be less than forthcoming in giving personal details.⁵ Nonetheless, a clear trend of incidents emerges from the cumulative data for the years studied, in terms of time of day, week day, and month of year when most incidents occur. These trends echo earlier study's findings that weekends and summer months are busiest and would help reduce the number of incidents and adverse health outcomes among the beachgoers by adding more lifeguards, provision of police help, and availability of physicians with an ambulance to provide first aid care at the beaches.⁵ Summer months are also the monsoon months fraught with heavy rains, and during these months sea tends to be rough and the pull of the tide is stronger; coupled with high number of people visiting beaches to seek solace from heat, culminating in high number of drowning and near drowning incidents at beaches in Karachi. However, increase of recorded incidents in the months of April to June, followed by precipitous drop of the recorded incidents in the months of July and August, suggest incomplete recording of incidents; as months of July and August in Karachi still register higher temperatures. It is also important to note that recovery of dead bodies tends to be delayed anywhere from few hours to several days, and that they may not necessarily be recovered from the same beach where these unfortunate individuals actually drowned. Sea waves, under-currents, tides, and visibility to lifeguards, determine location of dead body recovery.

Arguably, better provision of first aid care with availability

of properly equipped ambulance and a physician in attendance at ERC would reduce deaths due to near drowning.

In order to better understand the epidemiologic profile of near-drowning and actual drowning at the Karachi beaches, it is imperative to augment the record keeping system of incidents; perhaps switching to electronic record keeping system might yield more complete data, albeit at higher cost. There is need for greater public awareness about the dangers of drowning and the need to take precautionary measures. Better and more targeted health education and promotion campaigns coupled with public service announcements using print and electronic media during the months of summer would help beachgoers in Karachi to enjoy beaches while taking adequate precautions and being safe.

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