Data Article

Data on evaluation of AQI for different season in Kerman, Iran, 2015

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ABSTRACT

The purpose of this data, was to evaluate the air quality index of Kerman city in different season of 2015. The data showed that the PM10 and O3 were highest in the winter season and PM2.5, CO, SO2 and NO2 in the spring season as the air quality indexes. The highest number of unhealthy days was observed in spring in relation to PM2.5 and PM10 pollutants. The data showed that 33 and 9 days of the spring season had unfavorable conditions in relation PM2.5 and PM10 pollutants respectively. Therefore, the pollutant responsible for air pollution in Kerman was PM2.5. By comparing the air quality index in different seasons of 2015 in terms of different pollutants, it was found that in most of the seasons, Kerman has a desirable air quality index.

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### Specifications table

| Subject area                      | Environmental health engineering |
|----------------------------------|----------------------------------|
| More specific subject area       | Air pollution                    |
| Type of data                     | Tables, Figures                  |
| How data was acquired            | Collect raw data of air pollutants concentration from a Kerman Environmental Protection Agency |
| Data format                      | Raw, Analyzed                    |
| Experimental factors             | Processing Concentration measurement of pollutants by using air quality index |
| Experimental features            | The momentary concentration of air contaminants was detected by analyzers Ecotec and Horiba in 2015. |
| Data source location             | Kerman, Iran                     |
| Data accessibility               | The data are within this paper    |

### Value of the data

- The data can be used for policy maker in environmental management and ministry of health in Iran.
  The data showed that particulate matter were the responsible pollutant in the city Therefore, the essential actions must be taken to control such pollution and to minimize the community exposure to this pollutant.
- The data showed that precautionary measures be taken to control air pollution in terms of particle size and to reduce the level of contact with dust particles in the city of Kerman.

### 1. Data

Data presented here describe the air quality index for CO, PM$_{10}$, O$_3$, PM$_{2.5}$, SO$_2$ and NO$_2$ in different season of 2015 in Kerman, Iran (Tables 2–7). Fig. 2 shows the study area and the sampling points. Table 8 shows Kerman Meteorological Data by Month in 2015. Source of the particle in the Kerman city (NOAA hysplit model) presented in Fig. 1.

Due to the Alborz mountain range in the West of Kerman so often dust originating from the north of the town of Dasht-e Kavir Lut is. The following figure is taken from the US meteorological model that determines the source of dust.

### 2. Experimental design, materials and methods

#### 2.1. Study area description

Kerman is located in the southeastern and central parts of Iran. Kerman city is located between 30° 17’ 2.176’ north latitude and 57° 5’ 0.106’ east Longitude. Kerman city is limited to the provinces of Yazd and southern Khorasan, south of Hormozgan province, east to Sistan and Baluchistan province and west to Fars province. The city is influenced by various external and local winds. These winds make a lot of climate change in the city of Kerman [Fig. 2].

#### 2.2. Data collection

At first, the pollutant concentrations obtained from the Environmental Protection Agency (EPA) of Kerman city were validated and data with sufficient validity according to the Environmental
Table 1
Breakpoints for the AQI.

| Breakpoints | O₃ (ppm) 8 h | O₃ (ppm) 1 h | PM₂.₅ (µg/m³) 24 h | PM₁₀ (µg/m³) 24 h | CO (ppm) 8 h | SO₂ (ppm) 24 h | NO₂ (ppm) 1 h | AQI range | AQI category       |
|-------------|-------------|-------------|-------------------|------------------|-------------|----------------|----------------|-----------|------------------|
| 0–0.059     | –           | 0–15.4      | 0–54              | 0–4.4            | 0–0.034     | 0–0.053        | 0–50           | Good     |                  |
| 0.060–0.075 | –           | 15.5–35     | 55–154            | 4.5–9.4          | 0.035–0.144 | 0.054–0.1      | 51–100         | Moderate  |                  |
| 0.076–0.095 | 0.125–0.164 | 35.1–65.4   | 155–254           | 9.5–12.4         | 0.145–0.224 | 0.101–0.360    | 101–150        | Unhealthy for Sensitive Groups |
| 0.096–0.115 | 0.165–0.204 | 65.5–150.4  | 255–354           | 12.5–15.4        | 0.225–0.304 | 0.361–0.64     | 151–200        | Unhealthy |
| 0.116–0.374 | 0.205–0.404 | 150.5–250.4 | 355–424           | 15.5–30.4        | 0.305–0.604 | 0.65–12.4      | 201–300        | Very Unhealthy |
| *           | 0.405–0.504 | 250.5–350.5 | 425–504           | 30.5–40.4        | 0.605–0.804 | 1.25–1.64      | 301–400        | Hazardous |

* 0.505–0.604 350.5–500.4 505–604 50.5–50.5 0.805–1.004 1.65–2.04 401–500

* When the 8-h ozone concentration exceeds 0.374 ppm, the AQI 301 or higher should be calculated using a 1 h ozone concentration.
The concentration of particulate matter in the air by Horiba, Japan was measured by direct reading.

### Table 2
Comparison of health quality distribution for air CO in Kerman city in different seasons of 2015 (Per day).

| Season | Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very unhealthy | Hazardous | Missing data |
|--------|------|----------|--------------------------------|-----------|----------------|-----------|--------------|
| Spring | 88   | 0        | 0                              | 0         | 0              | 0         | 5            |
| Summer | 35   | 0        | 0                              | 0         | 0              | 0         | 58           |
| Autumn | 57   | 0        | 0                              | 0         | 0              | 0         | 32           |
| Winter | 62   | 0        | 0                              | 0         | 0              | 0         | 28           |

### Table 3
Comparison of health quality distribution for air PM10 in Kerman city in different seasons of 2015 (Per day).

| Season | Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very unhealthy | Hazardous | Missing data |
|--------|------|----------|--------------------------------|-----------|----------------|-----------|--------------|
| Spring | 16   | 65       | 9                              | 0         | 0              | 0         | 3            |
| Summer | 29   | 6        | 0                              | 0         | 0              | 0         | 58           |
| Autumn | 40   | 16       | 1                              | 0         | 0              | 0         | 32           |
| Winter | 50   | 11       | 1                              | 0         | 0              | 0         | 28           |

### Table 4
Comparison of health quality distribution for air O3 in Kerman city in different season of 2015 (Per day).

| Season | Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very unhealthy | Hazardous | Missing data |
|--------|------|----------|--------------------------------|-----------|----------------|-----------|--------------|
| Spring | 39   | 51       | 0                              | 0         | 0              | 0         | 3            |
| Summer | 29   | 33       | 0                              | 0         | 0              | 0         | 31           |
| Autumn | 64   | 26       | 0                              | 0         | 0              | 0         | 1            |
| Winter | 88   | 2        | 0                              | 0         | 0              | 0         | 0            |

### Table 5
Comparison of health quality distribution for air PM2.5 in Kerman city in different seasons of 2015 (Per day).

| Season | Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very unhealthy | Hazardous | Missing data |
|--------|------|----------|--------------------------------|-----------|----------------|-----------|--------------|
| Spring | 5    | 43       | 33                             | 8         | 0              | 0         | 4            |
| Summer | 3    | 29       | 15                             | 5         | 1              | 0         | 9            |
| Autumn | 1    | 49       | 28                             | 4         | 0              | 0         | 8            |
| Winter | 2    | 19       | 20                             | 5         | 0              | 0         | 44           |

### Table 6
Comparison of health quality distribution for air SO2 in Kerman city in different seasons of 2015 (Per day).

| Season | Good | Moderate | Unhealthy for sensitive groups | Unhealthy | Very unhealthy | Hazardous | Missing data |
|--------|------|----------|--------------------------------|-----------|----------------|-----------|--------------|
| Spring | 90   | 0        | 0                              | 0         | 0              | 0         | 3            |
| Summer | 33   | 0        | 0                              | 0         | 0              | 0         | 60           |
| Autumn | 49   | 8        | 0                              | 0         | 0              | 0         | 32           |
| Winter | 32   | 29       | 0                              | 0         | 0              | 0         | 29           |
The standard is for ozone (O₃) and Nitrogen dioxide (NO₂) from the maximum concentration of 1 h, for particulate matter and sulfur dioxide (SO₂) than the average 24-h maximum concentration for carbon monoxide (CO) 8-h concentration is used. The concentrations of carbon monoxide gas were averaged by moving method, so that concentrations of 8 h to 8 h of this pollutant were determined and then the highest concentration of 8 h was used to convert the Air Quality Index (AQI).

The amount below the daily index for all concentrations standardized pollutants using the Table 1 and equation 1 were determined. The highest value among sub-indicators as the final and pollutant indicator that represents the highest sub-index, as the pollutant responsible for introducing it turned out.

After calculating the final daily indicators and according to Table 1, the number of days and then the 2015 season in the five classes of standard pollution index were also determined [1–15].

\[ I_p = \frac{I_{Hi} - I_{Lo}}{BP_{Hi} - BP_{Lo}}(C_P - BP_{Lo}) + I_{Lo} \]

\[ I_p \] = The Air Quality Index
\[ C_P \] = The pollutant concentration
\[ C_{Lo} \] = The concentration breakpoint that is \( \leq C_P \)
\[ C_{Hi} \] = The concentration breakpoint that is \( \geq C_P \)
\[ I_{Lo} \] = The index breakpoint corresponding to \( C_{Lo} \)
\[ I_{Hi} \] = The index breakpoint corresponding to \( C_{Hi} \)
Fig. 1. Source of the particle in the Kerman city (NOAA hysplit model).

Fig. 2. Geographical map of the site study.
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Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at https://doi.org/10.1016/j.dib.2018.08.216.

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