

# Global and Regional Blindness Statistics

Current research shows 32.4-43.3 million blind people globally and 3.119 million in the Arab world, with no available data for Saudi Arabia.

## Abstract

Global estimates place the number of blind individuals between 32.4 and 43.3 million as of the 2010–2020 period. Three studies report figures near 43 million in 2020, while another cites 36.0 million (2015) and one reports 32.4 million (2010). In the Arab world, data from North Africa and the Middle East indicate 3.119 million blind individuals in 2010, with an age-standardized prevalence of 1.1%; a separate report from Oman notes a prevalence of 8.25% (2005) but does not provide an overall count. No study in the reviewed literature provides a numerical estimate for Saudi Arabia. Across investigations, blindness is defined predominantly as presenting visual acuity less than 3/60, and women consistently account for 55–60% of affected individuals.

## Paper search

Using your research question "How many blind people are there in the world, the Arab world and Saudi Arabia?", we searched across over 126 million academic papers from the Semantic Scholar corpus. We retrieved the 50 papers most relevant to the query.

## Screening

We screened in papers that met these criteria:

- **Study Design:** Is this a population-based study (not hospital-based or case series/reports)?
- **Blindness Definition:** Does the study use the WHO definition of blindness (visual acuity  $< 3/60$ )?
- **Geographic Coverage:** Does the study cover populations from the global, Arab world, or Saudi Arabian regions?
- **Outcome Reporting:** Does the study report prevalence or incidence of blindness with clear methodological description?
- **Study Type:** Is the study an epidemiological survey, census data, systematic review, or meta-analysis?
- **Age Data:** Does the study report age-specific blindness rates?
- **Vision Loss Type:** Does the study focus on permanent (not temporary/reversible) vision loss?
- **Sample Size:** Does the study include a sufficient population sample (not limited to case reports or small case series)?

We considered all screening questions together and made a holistic judgement about whether to screen in each paper.

## Data extraction

We asked a large language model to extract each data column below from each paper. We gave the model the extraction instructions shown below for each column.

- **Study Design:**

Identify the specific type of study design used:

- Systematic review and meta-analysis
- Population-based survey
- Cross-sectional study

Look in the methods section for explicit description of study design. If multiple designs are used, list all. If unclear, note "design not clearly specified".

- **Geographic Coverage:**

Extract the specific geographic regions studied:

- Global/worldwide coverage
- Specific countries or regions mentioned
- Focus on Arab world or Saudi Arabia

Look in methods, background, or results sections. Prioritize explicit statements about geographic scope. If multiple regions are covered, list all with specific percentages or numbers if available.

- **Population Age Range:**

Record the specific age groups studied:

- Total population age range
- Specific subgroup ages (e.g., 50 years)

Locate in methods section under participant selection or demographic details. If multiple age groups are analyzed, list all. If no specific age range is mentioned, note "not specified".

Record as: "X to Y years" or "Z years"

- **Blindness and Vision Impairment Prevalence:**

Extract precise prevalence figures:

- Total number of blind individuals
- Percentage of blind population
- Confidence intervals or uncertainty intervals
- Gender breakdown if provided

Look in results section. Prioritize most recent year's data. If multiple prevalence estimates exist, extract all with clear labeling of year and definition used.

Record prevalence with:

- Absolute number
- Percentage
- Confidence/uncertainty intervals
- Year of estimate

- **Data Collection Method:**

Describe the specific methods used to collect vision impairment data:

- Type of vision assessment (e.g., visual acuity testing)
- Specific measurement tools
- Population sampling approach

Locate in methods section. Look for details about vision screening, measurement standards, and data collection protocols.

If multiple methods were used, list all in order of prominence.

- **Temporal Trends in Blindness:**

Extract information about changes in blindness over time:

- Percentage change in blindness prevalence
- Absolute number changes
- Time periods compared
- Age-standardized prevalence changes

Look in results and discussion sections. Prioritize explicit statements about trends between specific years (e.g., 1990-2020).

Record as percentage change, with clear indication of time period and whether change is in prevalence or absolute numbers.

## Results

### Characteristics of Included Studies

Study	Study Region	Time Period	Population Size	Definition of Visual Impairment	Full text retrieved
Adelson et al., 2020	Global	1990-2020	No mention found	Blindness: presenting visual acuity less than 3/60 or less than 10° visual field around central fixation	No
Bourne et al., "Trends in Prevalence of Blindness"	Global	1990-2020	No mention found	Blindness: presenting visual acuity less than 3/60	No
Bourne et al., 2016	Global	1990-2010	No mention found	Blindness: presenting visual acuity less than 3/60	Yes
Bourne et al., 2020	Global	1990-2020	No mention found	Blindness: presenting visual acuity less than 3/60	No

Study	Study Region	Time Period	Population Size	Definition of Visual Impairment	Full text retrieved
Flaxman et al., 2017	Global	1990-2020	3,983,541 participants from 98 countries	Blindness: presenting visual acuity less than 3/60	No
Jonas et al., 2014	Global	1990-2010	No mention found	Blindness: presenting visual acuity less than 3/60	No
Khairallah et al., 2014	North Africa and Middle East	1990-2010	No mention found	Blindness: presenting visual acuity less than 3/60	Yes
Khandekar et al., 2007	Oman	1997-2005	No mention found	Blindness: presenting visual acuity less than 3/60	No
Pesudovs et al., 2024	Global	2000-2020	No mention found	Blindness: presenting visual acuity less than 3/60	Yes
Stevens et al., 2013	Global	1990-2010	No mention found	Blindness: presenting visual acuity less than 3/60	Yes

- We found that eight out of ten studies were global in scope, while one focused on a specific region (North Africa and Middle East) and one on a single country (Oman).
- The most common time periods studied were 1990-2020 and 1990-2010, each covered by four studies. We found one study covering 2000-2020 and one covering 1997-2005.
- We found specific population size information for only one study (3,983,541 participants from 98 countries). We didn't find population size information in the available full texts or abstracts of the other nine studies.
- The definition of visual impairment was consistent across most studies:
  - Nine out of ten studies defined blindness as presenting visual acuity less than 3/60
  - One out of ten studies used a slightly broader definition, including both presenting visual acuity less than 3/60 or less than 10° visual field around central fixation

## Global and Regional Prevalence

### Global Prevalence Trends

#### Age-Standardized vs. Crude Prevalence

Study	Total Blind Population	Age-Standardized Prevalence	Gender Distribution
Adelson et al., 2020	43.3 million (2020)	No mention found	55% female
Bourne et al., "Trends in Prevalence of Blindness"	43.3 million (2020)	No mention found	55% female
Bourne et al., 2016	2.1 million (due to glaucoma, 2010)	No mention found	No mention found
Bourne et al., 2020	43.2 million (2020)	No mention found	55% female
Flaxman et al., 2017	36.0 million (2015)	No mention found	No mention found
Jonas et al., 2014	2.1 million (due to macular diseases, 2010)	0.1% (adults 50 years, 2010)	No mention found
Khairallah et al., 2014	3.119 million (North Africa and Middle East, 2010)	1.1% (2010)	Women more affected
Khandekar et al., 2007	No mention found	8.25% (Oman, 2005)	No mention found
Pesudovs et al., 2024	17.01 million (due to cataract, 2020)	0.84% (due to cataract, adults 50 years, 2020)	60% female
Stevens et al., 2013	32.4 million (2010)	1.9% (adults 50 years, 2010)	60% female

- We found total blind population estimates for nine out of ten studies. These estimates varied widely:
  - Three studies reported around 43 million blind individuals globally
  - One study each reported 36.0 million and 32.4 million globally
  - Three studies reported on specific causes or regions, ranging from 2.1 to 17.01 million
  - We didn't find a total blind population estimate for one study
- We found age-standardized prevalence data for five out of ten studies:
  - These ranged from 0.1% to 8.25%
  - Three studies reported prevalence below 2%
  - One study reported 8.25% prevalence in Oman
  - We didn't find prevalence data for five studies
- We found gender distribution data for six out of ten studies:
  - Five studies reported a higher prevalence in females
    - \* Three studies reported 55% female
    - \* Two studies reported 60% female
  - One study reported that women were more affected without providing a percentage
  - We didn't find gender distribution data for four studies

## Arab World and Saudi Arabia

### Regional Context

#### Saudi Arabia Specific Data

Country/Region	Prevalence Rate	Primary Causes	Temporal Trends
North Africa and Middle East	1.1% (2010)	No mention found	Decreased from 2.1% in 1990 to 1.1% in 2010
Oman	8.25% (2005)	Cataract, corneal opacity	Increased from 7.23% in 1997 to 8.25% in 2005
Saudi Arabia	No mention found	No mention found	No mention found
Global (for comparison)	1.9% (adults 50 years, 2010)	Cataract, uncorrected refractive error	Decreased from 3.0% in 1990 to 1.9% in 2010 (adults 50 years)

We found prevalence rates for three out of four regions, ranging from 1.1% to 8.25%. The global prevalence for adults 50 years was 1.9% in 2010.

We found primary causes of visual impairment for two out of four regions. Cataract was reported in both regions, while corneal opacity and uncorrected refractive error were each reported in one region.

We found temporal trends for three out of four regions:

- Two regions showed a decrease in prevalence
- One region showed an increase in prevalence

In the available full texts and abstracts, we didn't find information on prevalence for Saudi Arabia, causes for North Africa and Middle East and Saudi Arabia, or temporal trends for Saudi Arabia.

## Temporal Trends and Projections

### Changes from 2000-2020

Key trend: Increasing absolute numbers, decreasing age-standardized prevalence

The included studies consistently show a trend of increasing absolute numbers of blind individuals globally, coupled with a decrease in age-standardized prevalence.

- Absolute numbers:
  - Flaxman et al. (2017): Increase from 36.0 million blind individuals in 2015 to a projected 38.5 million in 2020
  - Stevens et al. (2013): 32.4 million in 2010
  - Adelson et al. (2020) and Bourne et al. (2020): Approximately 43.3 million in 2020
- Age-standardized prevalence decrease:
  - Stevens et al. (2013): Decrease from 3.0% in 1990 to 1.9% in 2010 for adults 50 years globally
  - Khairallah et al. (2014): Decrease from 2.1% in 1990 to 1.1% in 2010 for North Africa and Middle East

Pesudovs et al. (2024) provide insight into the trends specific to cataract-related blindness:

- 29.7% increase in absolute numbers from 1990 to 2020
- 27.5% decrease in age-standardized prevalence over the same period

This pattern of increasing absolute numbers but decreasing age-standardized prevalence is consistent across studies and reflects the impact of population growth and aging on blindness prevalence.

Gender disparities persist over time, with women consistently accounting for 55-60% of the blind population across studies and time periods.

## Future Projections

While most studies focus on current prevalence or historical trends, some provide projections for future blindness prevalence. Bourne et al. ("Trends in Prevalence of Blindness") predict that by 2050, 61.0 million people will be blind globally. This projection suggests a continued increase in the absolute number of blind individuals, likely driven by population growth and aging.

It's important to note that these projections assume current trends will continue and do not account for potential advancements in eye care or changes in risk factors. The consistent finding of a high proportion of blindness due to preventable or treatable causes (e.g., cataract, uncorrected refractive errors) suggests that targeted interventions could significantly impact these projections.

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