Global Productivity Losses Due to Avoidable Sight Loss

IAPB evidence series

The IAPB Vision Atlas is powered by data from the Vision Loss Expert Group.

PRODUCTIVITY LOSS DUE TO AVOIDABLE SIGHT LOSS

Over 1.1 billion individuals worldwide experience sight loss.[1]

More alarming is that a vast majority — 90% — of cases arise from causes that are entirely preventable or treatable.[2,3] This means that nearly a billion people could have retained or regained their sight if they had access to timely and appropriate interventions.

The predominant causes of avoidable sight loss include untreated refractive errors, unoperated cataracts, and diseases like glaucoma or diabetic retinopathy that haven't been managed or detected early.

The high prevalence of avoidable sight loss underscores the urgent need for better global eye health. Addressing this issue not only benefits the affected individuals by enhancing their quality of life but also has broader societal and economic advantages.

The purpose of this study was to identify:

1. The proportion of global productivity losses due to avoidable causes of sight loss;

2. National estimates of global productivity losses due to avoidable causes of sight loss.

How we identified national estimates of avoidable productivity losses:

In order to identify what proportion of global productivity losses are due to avoidable causes, we conducted a secondary analysis of the Eckert model,[4,5] which was developed to generate national level estimates of productivity losses due to blindness and moderate to severe vision impairment (MSVI) in adults aged between 50 and 65 years at the national, regional, and global levels. Our approach:

1. Update the Eckert model with the latest GNI per Capita data from the World Bank and recalculate the monetary burden (GNI per Capita from the World Bank was from 2022 if available, for three countries GNI was sourced elsewhere),

2. Update the Eckert model with the crude prevalence of blindness and moderate to severe vision impairment from uncorrected refractive error and unoperated cataract at the GBD regional level, in adults 50 years and over, from Steinmetz et al (2021)[2] accessed via the IAPB Vision Atlas,

3. Calculate the proportion of all moderate to severe vision impairment and blindness that is due to refractive error and unoperated cataract,

4. Apply the proportion of prevalence calculated in (3) applied to the estimated monetary burden in (1),

5. Sum the estimate of the total economic burden associated with uncorrected refractive error with unoperated cataract for both 'high' and 'low' estimates.

6. Select the 'low' estimate of the burden due to refractive error and unoperated cataract in order to have the most confidence in the estimates.

On the following pages, the estimated productivity loss associated with avoidable sight loss in each country have been tabulated.

How do these estimates relate to prior estimates of productivity losses due to sight loss?

The Lancet Global Health Commission on Global Eye Health[3] still provides the most comprehensive assessment of the productivity losses due to sight loss, both avoidable and unavoidable. Based on a global systematic review, they found the global annual productivity loss (due to direct costs, productivity loss costs, informal care costs and intangible costs) attributable to vision impairment and blindness was estimated to be $410.7 billion (with a 95% uncertainty interval of $322.1–518.7 billion) in the year 2020.[3]

$411 billion (USD) is lost each year year due to sight loss

GBD Region: Central Europe, Eastern Europe, and Central Asia

GBD Region	Country	🏳	GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
Central Asia	Armenia		5,960	95 million
Central Asia	Azerbaijan		5,630	199 million
Central Asia	Georgia		5,620	142 million
Central Asia	Kazakhstan		9,470	655 million
Central Asia	Kyrgystan		1,410	19 million
Central Asia	Mongolia		4,210	33 million
Central Asia	Tajikistan		1,210	22 million
Central Asia	Turkmenistan		7,080	135 million
Central Asia	Uzbekistan		2,190	184 million
Central Europe	Albania		6,770	68 million
Central Europe	Bosnia and Herzegovina		7,660	361 million
Central Europe	Bulgaria		13,250	426 million
Central Europe	Croatia		19,470	370 million
Central Europe	Czech Republic/Czechia		26,590	1.2 billion
Central Europe	Hungary		19,010	800 million
Central Europe	Montenegro		10,400	22 million
Central Europe	North Macedonia		6,640	47 million
Central Europe	Poland		18,350	2.9 billion
Central Europe	Romania		15,660	1.3 billion
Central Europe	Serbia		9,140	318 million
Central Europe	Slovakia		22,060	447 million
Central Europe	Slovenia		30,600	292 million
Eastern Europe	Belarus		7,240	333 million
Eastern Europe	Estonia		27,640	143 million
Eastern Europe	Latvia		21,500	244 million
Eastern Europe	Lithuania		23,690	393 million
Eastern Europe	Russia		12,830	10.7 billion
Eastern Europe	Ukraine		4,270	967 million

GNI: Gross National Income; Productivity loss in adults aged 50-65 years old due to uncorrected refractive error an unoperated cataract.

Table: IAPB Knowledge Team • Created with Datawrapper

GBD Region: High Income

GBD Region	Country	🏳	GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
Australasia	Australia		60,430	3.8 billion
Australasia	New Zealand		48,460	608 million
High-income Asia Pacific	Brunei/Brunei Darussalam		31,410	15 million
High-income Asia Pacific	Japan		42,440	20.6 billion
High-income Asia Pacific	Singapore		67,200	1.2 billion
High-income Asia Pacific	South Korea		35,990	5.0 billion
High-income North America	Canada		52,960	4.2 billion
High-income North America	United States		76,370	50.4 billion
Southern Latin America	Argentina		11,620	1.4 billion
Southern Latin America	Chile		15,360	838 million
Southern Latin America	Uruguay		18,030	207 million
Western Europe	Austria		56,140	1.8 billion
Western Europe	Belgium		48,700	1.9 billion
Western Europe	Cyprus		30,540	92 million
Western Europe	Denmark		73,200	1.4 billion
Western Europe	Finland		54,360	1.1 billion
Western Europe	France		45,860	10.4 billion
Western Europe	Germany		53,390	17.5 billion
Western Europe	Greece		21,740	818 million
Western Europe	Iceland		68,220	55 million
Western Europe	Ireland		81,070	986 million
Western Europe	Israel		54,650	989 million
Western Europe	Italy		37,700	13.3 billion
Western Europe	Luxembourg		91,200	152 million
Western Europe	Malta		33,550	50 million
Western Europe	Netherlands		57,430	2.8 billion
Western Europe	Norway		95,510	1.7 billion
Western Europe	Portugal		25,800	1.1 billion
Western Europe	Spain		31,680	9.7 billion
Western Europe	Switzerland		89,450	2.6 billion
Western Europe	Sweden		62,990	1.7 billion
Western Europe	United Kingdom		48,890	12.5 billion

GNI: Gross National Income; Productivity loss in adults aged 50-65 years old due to uncorrected refractive error an unoperated cataract.
Table: IAPB Knowledge Team • Created with Datawrapper

GBD Region: Latin America and Caribbean

GBD Region	Country	🏳	GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
Andean Latin America	Bolivia		3,450	149 million
Andean Latin America	Ecuador		6,310	380 million
Andean Latin America	Peru		6,770	1.3 billion
Caribbean	Antigua and Barbuda		18,280	4 million
Caribbean	Bahamas		31,530	24 million
Caribbean	Barbados		19,350	9 million
Caribbean	Belize		6,800	3 million
Caribbean	Cuba		8,920	472 million
Caribbean	Dominican Republic		9,050	236 million
Caribbean	Grenada		9,340	2 million
Caribbean	Guyana		15,050	20 million
Caribbean	Haiti		1,610	23 million
Caribbean	Jamaica		5,670	37 million
Caribbean	Puerto Rico		24,560	307 million
Caribbean	Saint Lucia		11,160	5 million
Caribbean	St Vincent and the Grenadines		9,110	2 million
Caribbean	Suriname		4,880	6 million
Caribbean	Trinidad and Tobago		16,330	62 million
Caribbean	US Virgin Islands (GDP, 2020)		39,552	16 million
Central Latin America	Colombia		6,510	1.4 billion
Central Latin America	Costa Rica		12,670	271 million
Central Latin America	El Salvador		4,720	129 million
Central Latin America	Guatemala		5,350	272 million
Central Latin America	Honduras		2,740	61 million
Central Latin America	Mexico		10,410	4.3 billion
Central Latin America	Nicaragua		2,090	38 million
Central Latin America	Panama		16,750	284 million
Central Latin America	Venezuela		13,010	1.2 billion
Tropical Latin America	Brazil		8,140	7.6 billion
Tropical Latin America	Paraguay		5,920	135 million

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Table: IAPB Knowledge Team • Created with Datawrapper

GBD Region: North Africa and Middle East

GBD Region	Country	🏳	GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
North Africa and Middle East	Afghanistan		390	30 million
North Africa and Middle East	Algeria		3,900	704 million
North Africa and Middle East	Bahrain		27,180	100 million
North Africa and Middle East	Egypt		4,100	1.5 billion
North Africa and Middle East	Iran		3,900	1.5 billion
North Africa and Middle East	Iraq		5,270	490 million
North Africa and Middle East	Jordan		4,260	94 million
North Africa and Middle East	Kuwait		39,570	563 million
North Africa and Middle East	Lebanon		4,970	178 million
North Africa and Middle East	Libya		7,260	156 million
North Africa and Middle East	Morocco		3,710	585 million
North Africa and Middle East	Oman		20,150	314 million
North Africa and Middle East	Palestine/West Bank and Gaza		4,610	51 million
North Africa and Middle East	Qatar		70,500	343 million
North Africa and Middle East	Saudi Arabia		27,590	3.4 billion
North Africa and Middle East	Sudan		760	77 million
North Africa and Middle East	Syria/Syrian Arab Republic		760	41 million
North Africa and Middle East	Tunisia		3,230	173 million
North Africa and Middle East	Turkey		10,590	3.4 billion
North Africa and Middle East	United Arab Emirates		48,950	629 million
North Africa and Middle East	Yemen		840	47 million

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GBD Region: South Asia, Southeast Asia, East Asia, Oceania

GBD Region	Country	🏳	GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
South Asia	Bangladesh		2,820	2.9 billion
South Asia	Bhutan		3,040	7 million
South Asia	India		2,380	27.4 billion
South Asia	Nepal		1,340	203 million
South Asia	Pakistan		1,580	1.8 billion
East Asia	China		12,850	96.2 billion
East Asia	North Korea (Non World Bank Source, 2021)		662	48 million
East Asia	Taiwan		8,426	723 million
Oceania	Federated States of Micronesia		4,130	1 million
Oceania	Fiji		5,270	25 million
Oceania	Guam (GDP per capita, 2021)		35,905	38 million
Oceania	Kiribati		3,280	119 million
Oceania	Papua New Guinea		2,730	91 million
Oceania	Samoa		3,630	2 million
Oceania	Solomon Islands		2,220	4 million
Oceania	Tonga		4,930	1 million
Oceania	Vanuatu		3,560	2 million
Southeast Asia	Cambodia		1,700	131 million
Southeast Asia	Indonesia		4,580	7.4 billion
Southeast Asia	Laos		2,360	41 million
Southeast Asia	Malaysia		11,780	1.8 billion
Southeast Asia	Maldives		11,030	14 million
Southeast Asia	Mauritius		10,760	107 million
Southeast Asia	Myanmar		1,210	358 million
Southeast Asia	Philippines		3,950	1.6 billion
Southeast Asia	Seychelles		14,340	8 million
Southeast Asia	Sri Lanka		3,610	602 million
Southeast Asia	Thailand		7,230	4.5 billion
Southeast Asia	Timor-Leste		1,970	11 million
Southeast Asia	Vietnam		4,010	1.9 billion

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GBD Region: Sub-Saharan Africa (1/2)

GBD Region	Country		GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
Central Sub-saharan Africa	Angola		1,900	58 million
Central Sub-saharan Africa	Central African Republic		480	2 million
Central Sub-saharan Africa	Congo (Brazzazville)		2,060	15 million
Central Sub-saharan Africa	Democratic Republic of the Congo (Kinshasa)		590	65 million
Central Sub-saharan Africa	Equatorial Guinea		5,320	7 million
Central Sub-saharan Africa	Gabon		7,540	22 million
Eastern sub-Saharan Africa	Burundi		240	1 million
Eastern sub-Saharan Africa	Comoros		1,610	2 million
Eastern sub-Saharan Africa	Djibouti		3,180	5 million
Eastern sub-Saharan Africa	Eritrea		610	3 million
Eastern sub-Saharan Africa	Ethiopia		1,020	241 million
Eastern sub-Saharan Africa	Kenya		2,170	151 million
Eastern sub-Saharan Africa	Madagascar		510	15 million
Eastern sub-Saharan Africa	Malawi		640	17 million
Eastern sub-Saharan Africa	Mozambique		500	19 million
Eastern sub-Saharan Africa	Rwanda		930	11 million
Eastern sub-Saharan Africa	Somalia		470	10 million
Eastern sub-Saharan Africa	South Sudan		1,040	28 million
Eastern sub-Saharan Africa	Tanzania		1,200	101 million
Eastern sub-Saharan Africa	Uganda		930	31 million
Eastern sub-Saharan Africa	Zambia		1,170	19 million
Southern sub-Saharan Africa	Botswana		7,350	32 million
Southern sub-Saharan Africa	Eswatini		3,800	6 million
Southern sub-Saharan Africa	Lesotho		1,260	5 million
Southern sub-Saharan Africa	Namibia		4,880	21 million
Southern sub-Saharan Africa	South Africa		6,780	901 million
Southern sub-Saharan Africa	Zimbabwe		1,500	33 million

GNI: Gross National Income; Productivity loss in adults aged 50-65 years old due to uncorrected refractive error an unoperated cataract.

Table: IAPB Knowledge Team • Created with Datawrapper

GBD Region: Sub-Saharan Africa (2/2)

GBD Region	Country		GNI per capita (USD)	Productivity loss due to avoidable sight loss (USD)
Southern sub-Saharan Africa	Botswana		7,350	32 million
Southern sub-Saharan Africa	Eswatini		3,800	6 million
Southern sub-Saharan Africa	Lesotho		1,260	5 million
Southern sub-Saharan Africa	Namibia		4,880	21 million
Southern sub-Saharan Africa	South Africa		6,780	901 million
Southern sub-Saharan Africa	Zimbabwe		1,500	33 million
Western sub-Saharan Africa	Benin		1,400	32 million
Western sub-Saharan Africa	Burkina Faso		840	27 million
Western sub-Saharan Africa	Cape Verde/Cabo Verde		4,140	5 million
Western sub-Saharan Africa	Cameroon		1,660	66 million
Western sub-Saharan Africa	Chad		690	17 million
Western sub-Saharan Africa	Cote D'Ivoire		2,620	117 million
Western sub-Saharan Africa	Gambia		810	3 million
Western sub-Saharan Africa	Ghana		2,350	187 million
Western sub-Saharan Africa	Guinea		1,180	28 million
Western sub-Saharan Africa	Guinea-Bissau		820	2 million
Western sub-Saharan Africa	Liberia		680	6 million
Western sub-Saharan Africa	Mali		850	29 million
Western sub-Saharan Africa	Mauritania		2,160	20 million
Western sub-Saharan Africa	Niger		610	24 million
Western sub-Saharan Africa	Nigeria		2,140	1.0 billion
Western sub-Saharan Africa	Sao Tome and Principe		2,410	1 million
Western sub-Saharan Africa	Senegal		1,640	49 million
Western sub-Saharan Africa	Sierra Leone		510	7 million
Western sub-Saharan Africa	Togo		990	14 million

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What are the limitations of this work?

The values reported here are likely to be significantly underestimates becuase of the following reasons:

- The model only includes adults aged 50 to 60 years due to limitations in the prevalence of sight loss in younger working aged adults. While the bulk of sight loss is in older adults,[1] there will be avoidable sight loss in younger working adults has not been included here.

- The Eckert model[4,5] generates a 'high' and 'low' estimate for productivity loss in each country. For simplicity, we have chosen to select one estimate, and are using the low estimate to ensure we are not overstating the issue. However, in most instances, the actual productivity loss will be higher.

What do these findings mean?

Over a billion people worldwide experience sight loss, with a staggering 90% of these cases being preventable or treatable. This avoidable sight loss not only diminishes individual quality of life but also has an enormous economic impact.

This research, based on the Eckert model, specifically analyzed the portion of these losses attributed to avoidable causes. However, as these figures are conservative, focus on adults aged 50-65 and use the lower-end estimates for accuracy, the actual economic implications could be much higher.

This research underscores the tangible and substantial economic benefits of prioritizing eye care. By addressing avoidable sight loss—specifically untreated refractive errors and unoperated cataracts—nations have the opportunity to reclaim a significant portion of the lost productivity. With over a billion individuals affected by sight loss, the economic ramifications are clear. Investing in eye care isn't just a health prerogative; it's an economic imperative.

For more information check the **Vision Atlas**

Image: Shailendra Kumar

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Image: Anurag Kumar