

THE INCREDIBLE PARADOX OF VISION



JEAN-FÉLIX BIOSSE DUPLAN
President Vision Impact Institute®,
France



VISION IMPACT INSTITUTE™
Vision has a voice

SUMMARY

Around 2.5 billion people worldwide have poor vision and remain without visual correction. Because of this their personal and professional lives suffer permanent consequences. This major handicap at world level is massively underestimated by all those involved. Disinterest, ignorance or refusal to see the reality when solutions are both available and simple. 80% of visual defects are avoidable.

The Vision Impact Institute® was set up in 2013 to get attitudes to change and call on the policy makers to implement efficient action plans. Its mission is to reveal the socio-economic impact of impaired vision and to work on reducing the unnecessary costs for individuals and their countries.

The philosopher Anaxagoras said "Man is intelligent because he has a hand". One could add that the world in which we live has been built with man's vision. The vision that lights the future but also vision which is sight, a sense that has been essential in the History of past centuries. Explorers in the fifteenth century had to decrypt maps and the discovery of new continents was not just a matter of setting foot on the sand. The monarchs and conquerors of the eighteenth century used their vision on battle plans in order to conquer new lands. Scientific and industrial progress was made by the scientists, industrialists and doctors of the nineteenth century in step with the increasing use of monacles and spectacles.

But although the need to see well was a necessity for all, this possibility was in fact linked to the exercise of certain professions and therefore reserved for an elite.

The first fundamental development came in the nineteen fifties with schooling for all, new lifestyles and the advent of television. Good eyesight was no longer reserved for the few, it became accessible to all. The end of the twentieth century brought about a still more major development: the professional world switched to the use of the computer as its sole tool (in a company, what percentage of employees does not work on screen?). In turn, domestic life has undergone a strong and rapid development in terms of computers and screens. Numerous screens have arrived, ever smaller, in colour, in relief, portable, video game consoles, tablets,

The invasion of mobile phones – 7 billion worldwide – followed by that of smartphones accentuates still further our dependence on a screen

that helps us to live. We use them to read, write, get information, work, play, take photos, pay, check our cardiac rhythm, etc. 65% of Americans spend 3 hours a day in front of a screen, and 28% over 10 hours.^[1] On the date of printing this article, 1 billion apps for smartphones are available. And every day 1107 new apps are launched on Android.^[2]

Whether we want to accept the fact or not, vision has become the absolutely essential sense for working, having a successful professional life, everyday life and dialoguing with the younger generations ...

Although an absolute necessity, good vision is not given to all. 60% of the world population, i.e. 4.2 billion individuals, have poor vision. More serious still, only 1.7 billion have corrected their vision, meaning that 2.5 billion people (children, young adults, seniors, men and women in both mature and emerging countries...) have impaired vision due to uncorrected refractive error.^[3]

It is the world's biggest handicap.

And 80% of visual disorders are avoidable.

Since vision is a sense that is vital for our existence, you might expect it to be studied, protected and cared about, for our personal and collective good. Anti-smoking campaigns, vaccination campaigns, messages about road safety, against alcohol, obesity, sedentary living, transmittable diseases – very few of our activities are not closely supervised by the public authorities. All except one: vision! The first paradox is that people with poor vision do not know that they have a problem! Migraine or backache is treated immediately whereas millions of people spend their entire lives with poor vision!

Several strategies are used.

- Refusal

People no longer attempt to carry out activities that have become impossible for them, including some types of reading, games or leisure activities. Others make the best of things, using their memory – like the lady driving in Paris who knows her journey by heart and finds her way using a shop window, bus stop or monument!^[4]

For themselves in everyday life: 14% do not wear their glasses in front of the computer screen and this figure increases to 21% of 16-24 years old! 29% believe that it is not essential to wear their glasses in the house and 16% don't put them on when taking their medicines. At the wheel, 22%^[5] do not wear their glasses for driving.

- Lack of interest and ignorance

In Great Britain, from a panel of 1000 people aged 40-75 years, 41% had noticed a reduction in their vision but had done nothing about it.

	Children	Seniors	Workers	Drivers
Personal	School failure Self esteem Future	Isolation Quality of life	Income Self esteem	Safety Job
Social	Performance Delinquency	Autonomy Dependance	Accidents Reputation Non quality	Accidents Autonomy

TAB. 1

8% declared that they had never been to the opticians and over half had delayed having an eye test for five years ^[6].

When vision testing programmes are organised, we observe that half those who are diagnosed as requiring correction for their vision do nothing and go on as before.

Populations are not really challenged by the media, where this topic is addressed only rarely and most often from the point of view of the product – the eyewear – in fashion and design terms. Spectacles or contact lenses are considered to be either too complex or too summary and do not capture the attention. The day before World Sight Day a communiqué that had been prepared well in advance and sent to the media, dealing with the social and economic stakes of good vision, was put aside to make room for another item on flu! The question of the price of optical equipment, which is considered to be too high, because it is misunderstood, is one of the recurrent angles used, whilst very little attention is given to the idea of visual health.

Employers have not yet integrated the importance of good vision for their staff. A study carried out in the United States showed that 50% of companies offer their employees a supplementary dental health plan but only 21% offer the same advantage for vision. ^[7] Companies that have devoted considerable budgets to training, have invested in processes to improve quality and reduce costs and non-quality, do not check whether their employees have perfect eyesight. In Germany applicants are subjected to a health check, including a vision test, when interviewing for jobs in large companies. This is an isolated example in Europe. Germany is also a country whose products are well known for their quality, offering a competitive advantage. This is probably not a coincidence!

The public authorities themselves are also strangely silent. Education systems do not consider good vision to be a priority. Learning to drive includes a decree that only encourages testing but there are no obligations. Seniors in retirement homes in France cannot receive a visit from their optician. A law dating back to June 5th, 1944 bans them from carrying on their business anywhere outside of their shop. Many official reports on accidents at work, elderly people, vision at the wheel and school performance do not mention the decisive contribution made by good vision. When we point out the strong correlation proven by numerous studies, we are listened to politely but no major action ensues.

To get things moving we must go further and highlight the costs of poor vision ...

The socio-economic impact of impaired vision (uncorrected refractive error) is indeed considerable. The Vision Impact Institute® which is beginning to research it, is in a position to show the enormous costs resulting from individual situations multiplied by the number of people impacted.

It has taken almost a year to gather together around a hundred studies

worldwide. These are studies that mainly involve four categories: children, old people, vision at work and vision at the wheel. Mainly of Anglo-Saxon origin, the studies were carried out by universities, NGOs or organisations of optometrists and ophthalmologists. Previously known, widely distributed studies had described impacts. These studies, and this is new, calculate and estimate the costs involved.

There are in fact a great many impacts (Tab. 1)

All stakeholders agree on the impacts, but nothing is really changing. Correcting vision is not dealt with as a public health problem. And here we are only talking about a simple refractive error. More serious pathologies, such as cataract, glaucoma or AMD are not included in any of the Institute's studies.

A Brazilian study involving 222 students showed that children with a visual acuity of less than 20/20 are at 3 times more risk of retaking a school year than children with good vision ^[8]. Beyond this direct and dramatic consequence, one may ask what is the impact on the child's personal development, his continued studies, his employability, his future income, for him and his family, his village, his region and, in the end, his country. Answering these questions means acknowledging that uncorrected refractive error has a significant impact on a country's economic growth. And this is not limited to children. The economic impact is coupled with a social impact that affects the conditions and quality of life, which are still more difficult to calculate.

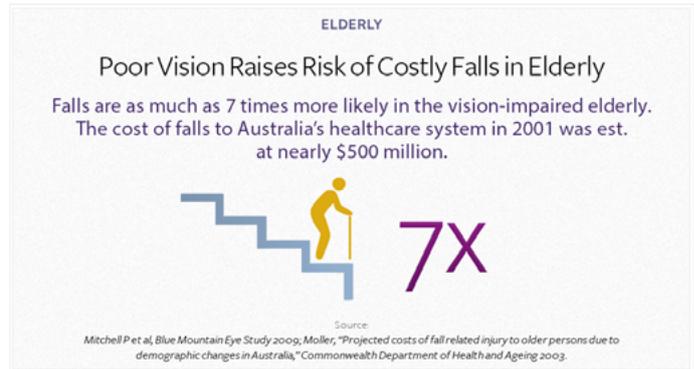
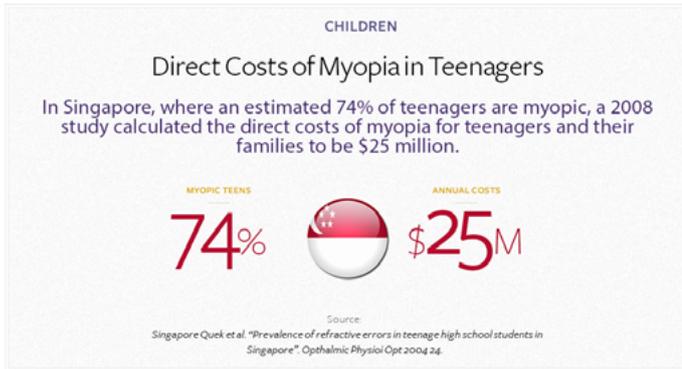
Children are the most vulnerable category because they do not know what they can't see and have no access to solutions by themselves. Studies undertaken on children, although they demonstrate the correlation between good vision and good reading ability ^[9], the link with achievement at school and even with delinquency (70% of young delinquents in American prisons have an uncorrected refractive error ^[10]), only cover in small part the economic impact involved. The State of Singapore has calculated that 25 million dollars are spent every year by parents, just to provide their children with optical equipment. ^[11]

However there is a major lack of studies involving students and young adults.

It is at work that the impacts of poor vision have been studied most and these have been demonstrated to be considerable. The effects on productivity, on accidents at work, on individual performance, on income and employability, are all indicators that demonstrate the ravages and inequality created by poor vision that goes uncorrected. The worldwide loss of productivity due to poor vision is estimated by the WHO at 193 billion euros per year. And this figure does not involved emerging countries only, in France it represents eight million euros per day and forty-two million in the United States! ^[12]

- In India it has been observed that the individual productivity of employees with their vision corrected is 34% better than those without corrected vision. ^[13]

- The income gap between people with good vision and those without is estimated at 70%. ^[14]



- - Amongst people working on screen whose astigmatism has been corrected, productivity increased by 20%.^[15]
- A simple eyesight examination, because it enables early detection of employees with diabetes or high blood pressure, saves companies the 62% additional costs for an employee whose issues have not been detected.^[16]

The corporate world is without doubt the place where it will be easiest to make progress in terms of the knowledge of impacts on work on screen, on the quality of production, etc. because it is here that data is easy to collect and profitability and quality of life issues are the most evident.

This is not the case for elderly people, amongst whom studies are all too rare. Another paradox is found here amongst this population, which is increasing but which is being neglected. And yet there are strong hints that this is a major issue.

- Number involved : 91% of seniors have visual problems of all kinds.^[3]
- In everyday life the risk of falling and fracture of the hip is multiplied by seven, which causes direct costs of 38 million euros in France and 73 million in Germany.^[17]
- Elderly people represent 65% of all indirect costs (home care, care workers, public assistance) incurred by poor vision.^[18]
- Serious risks of isolation, depression and suicide have been observed in several countries – no figure has as yet been put on these issues, but they are undeniable.

Vision whilst driving also gives rise to a strange paradox: colossal investment is devoted to making cars safer and the roads less dangerous. Every kind of technology is used to reduce the number of road victims, and wonderful progress is being observed. But drivers are quite simply forgotten! Car manufacturers say that automatic vehicles will do away with the human factor. And yet a simple eye exam when driving tests are taken and then every five years could reduce the number of accidents still further.

- In Great Britain, since the introduction of stricter vision checks, the number of people failing their test has increased from 1600 to 4000 in just four years.^[19]
- Young people aged between 15 and 44 represent 59% of victims.^[20]
- An Italian study estimates that 59% of road accidents are due to poor vision, which is equivalent to a cost for the country of 18 billion euros per year.^[21]
- Seniors involved in an accident are 8 times more likely to have a visual deficiency in terms of contrast.^[22]

There are of course seniors who work and drive

All these studies constitute the first database available on the socio-economic impact of poor vision. But the subject is only covered in part. There are categories that are covered only very little or only very poorly

(children, seniors), countries and entire continents are missing (Africa, Southern and Eastern Europe, Asia, Russia). These studies must be distributed more widely to encourage States, research workers and Universities to replicate them in their own countries and to start new studies in order to improve knowledge of these phenomena.

The number of people concerned and the amounts of money involved can be discouraging when faced with the enormity and complexity of the task.

But there are two pieces of "good news" to take into consideration:

Here we are not referring to additional expenditure to combat a disease, but rather to *costs* that can be reduced. Losses in productivity, domestic accidents, time lost, road accidents, falls and the loss of autonomy are just so many problems that can be eliminated with a reasonable amount of investment. The WHO estimates that 20 billion euros would be necessary to eliminate the 193 billion in loss of productivity.

The second essential point concerns solutions. To resolve the matter of poor vision worldwide there is no need for complex, expensive treatment, no hospital stays or medicines. Optical correction solutions exist, they are simple proven, varied and accessible to all.

This is **good news in itself**, which should encourage us to get mobilised because the future will have its own share of spectacular challenges.

a) Population ageing.

This is a phenomenon that has finally been identified and its consequences on vision are clear. In 2012, one in every nine people was aged over 60, in 2050 it will be one in five^[23]. And seniors suffer from a range of refractive errors or more serious pathologies : presbyopia, cataract, AMD...

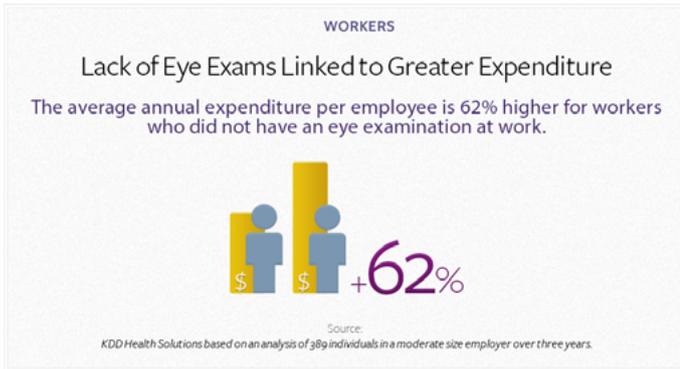
b) The acceleration of myopia.

80% of Chinese high school students are myopic, the prevalence in the United States has increased from 25% in 1970 to 40% in 2009. The lifestyle which is now becoming universal would appear to be the main cause, far and away ahead of genetics. A recent report shows correlation between a severe form of myopia and blindness!^[24]

c) Healthcare costs in emerging countries will not go down thanks to economic growth. On the contrary they will increase in parallel due to the arrival of new requirements, sophisticated technologies and the need for qualified staff.

d) Older workers

Population ageing and the postponement of retirement will combine the need for visual health and the requirements for efficiency at work.



- Host a web platform working with researchers in order to increase visibility of the subject
- Tirelessly highlight the challenges of good vision to help the policy makers to make the right decisions
- Identify the regulations or laws that reduce access to good eyesight, in order to get them changed
- Take part in world organisations and the major visual health conventions in order to encourage increased participation by the optical community.

The Vision Impact Institute® is supported by Essilor. It is a non profit organisation. 

www.visionimpactinstitute.org

e) Road traffic

The number of cars on the road is set to double over the next twenty years. Road deaths could become the fifth largest cause of death worldwide (currently 8th).^[18]

f) The number of vision professionals which conditions access to

solutions. It is essential for differences between regions to be reduced: one ophthalmologist for 12000 people in Europe, one for 33000 in Asia and one for 389000 in Africa. One optician's store in Europe for 8000 people, one for 25000 in Asia.^[25]

In order to meet these challenges, public authorities, professionals and individuals must be alerted to the stakes involved with vision that is not corrected. The task of the Vision Impact Institute® is precisely to create awareness of these challenges.

Action plans:

- Multiply vision tests in places where the categories concerned are to be found (schools, faculties, companies, driving schools, retirement homes).
- Develop training for vision professionals in order to facilitate access to solutions.

Created in March 2013, The Vision Impact Institute® is guided in its work by an Advisory Board of eminent personalities:

Professor Clare Gibert, ophthalmologist at the London School of Hygiene and Tropical Medicine, London

Professor Kevin Frick, Vice-Dean of the Johns Hopkins Carey Business School, Baltimore

Mr Arun Bharat Ram, President of SRF Group, Delhi

His Excellency Wu Jianmin, Former Ambassador of the People's Republic of China in France and to the UN in Geneva, Beijing.

After collecting the results of around a hundred studies that have been carried out worldwide on this topic, which is still relatively unknown, and making them available to communities on the website, we must :

- Continue the research and encourage new studies in order to combat ignorance or lack of interest
- Produce exclusive content on this subject: white paper, proposals for new topics, articles or blogs to attract media attention and opinion leaders influence.

REFERENCES

<p>1. The Vision Council reports on digital eye strain, 2012-2013</p> <p>2. www.commentcamarche.net, 30/08/2013</p> <p>3. Vision Impact Institute, Essilor, World Bank, WHO</p> <p>4. France 2 Journal de 20 h 15/08/2012</p> <p>5. ASNAV, Baromètre de la Santé Visuelle, Paris, 2013</p> <p>6. Simply health Advisory Research Panel (SHARP) 2013</p> <p>7. Kaiser/HRET Survey of employer sponsored health benefits, 2006</p> <p>8. Early detection of visual impairment and its relation with school effectiveness, Cumani Toledo et Al, University Juiz de Fora, 2010</p>	<p>9. Vision et lecture, Association Nationale pour l'Amélioration de la Vue, Paris, 1995</p> <p>10. Vision's relationship to delinquency, illiteracy and learning problems, Zaba JN, 2001,</p> <p>11. Prevalence of refractive errors in teenage high school students in Singapore, Quek et Al, Ophthalmic Physio Opt 2004</p> <p>12. Potential lost productivity resulting from global burden of uncorrected refractive error, Bull World health organ, 2008</p> <p>13. The vision Spring, University of Michigan,</p> <p>14. An estimation of the worldwide economic and health burden of visual impairment, Gordojs et Al, 2011</p> <p>15. Productivity associated with visual status of computers users, Daum, 2004</p>	<p>16. Comprehensive eye and vision examination, Barnwell, 2010</p> <p>17. Projected costs of fall related injury to older persons .., Mitchell P & al, Blue Mountain study, 2009</p> <p>18. The economic burden of vision loss and eye disorders in the United States, Wintterborn, Rein, 2013</p> <p>19. Cooperative motor group, 2011</p> <p>20. Organisation Mondiale de la Santé</p> <p>21. The importance of precise sight correction for safe driving, Université de Milan Bicocca, Maffioletti, 2009</p> <p>22. Visual risk factors for crash involvement in older drivers with cataracts, Owsley, 2001</p> <p>23. United Nations</p>	<p>24. A Vision for all to see, Brien Holden Vision Institute, 2013</p> <p>25. Informarché Essilor 2012</p>
--	--	---	---