

# iCARE-1

## Indian **C**hild **A**ctivity **R**ecommendations – Mark 1

### Air Pollution-related Outdoor Activity Guidance for Schools and Child-Care Centers in India

RECOMMENDED BY

#RESPONSIBLESPORT

#MYRIGHTTOBREATHE

BACKGROUND RESEARCH & ANALYSIS BY:

GITA SINHA, MD, MPH

FACILITATED BY:

INDICUS FOUNDATION

THIS VERSION: 20 OCTOBER 2019

# Indian Children's Activity Recommendations - Mark 1

- ▶ This is purely a guidance and does not substitute for informed medical advice
- ▶ Current version (Mark 1) based on Air Quality Index put out by CPCB.
- ▶ Based on analysis of advisories for children participating in school and other outdoor/sports activities, brought out by authorities in multiple countries including India, USA and Singapore
- ▶ The existing advisories in Singapore/SE Asia, Europe, and USA direct their guidance to school and institutional leadership
- ▶ Recommend institutions to monitor their current and forecasted air quality, consider the risk factors for their child populations/sports events, and then use guidance to decide whether to restrict activity that day
- ▶ Prioritize this guidance for all who participate in, teach, or supervise outdoor activities, including children, those children/adults with known chronic conditions, and elderly adults
- ▶ This guidance utilizes the evidence of health harms from PM2.5, which is a known causative factor for both short- and long-term health harms affecting the entirety of development, physical, and mental health.
- ▶ However, it is known that other air pollution components such as Ozone, volatile organic compounds (VOC) can also confer health harms.
- ▶ The official reported AQI incorporates all pollution component levels. Later versions of this guidance would provide differential guidance for other pollutants.

# Important Suggested Steps to Implement This Guidance.

- ▶ 1) Assemble an institution-based group of stakeholders (e.g. leadership, teachers, coaches, parents, older/mature students, etc.)
- ▶ 2) Assess sources of air pollution exposure in and around the institution grounds (e.g. vehicular traffic <200m from school entry/exit points; DG sets; construction sites; power plants) - Can any of these be minimized?
- ▶ 3) Determine the risk factor profile of the students/staff: focus on risk groups of children <10 years old, children and adults with medical conditions, and elderly adults >60 years old.
- ▶ 4) Create a system for receiving AQI/regular air quality monitoring at or closely around the institution. Receive local AQI readings and forecasts online, and/or install sensors/monitors around the school grounds.
- ▶ 5) Study this guidance to design Alternative Activity Plans for days when normal activities must be limited. Alternative activities will have to be designed around a) level of exertion b) duration c) location d) restricting some students due to their age or medical conditions
- ▶ 6) Implement the plan and Test the plan. Daily, record a) air quality reading b) change in activities implemented c) whether the activity change was feasible/acceptable to the stakeholders. d) Take feedback and record your impressions!
- ▶ 7) Use the findings from 6) to make adjustments and improvements to the activity plan. Even small changes can help to make a difference to children's air pollution exposures and short- and long-term health harm.



# Background

- ▶ This guidance is especially targeted for all children and elderly (>60 yo) regardless of health condition, and those children/adults with known chronic conditions
- ▶ All of the above are considered risk groups for air pollution associated health harm
- ▶ Any Individual can have their own specific considerations limiting intense exercise
- ▶ Those suffering from Asthma or other chronic medical conditions must take professional medical advice before undertaking any physical activity
- ▶ Advisories and restrictions should be considered for any outdoor activity
- ▶ This guidance does not substitute for formal medical advice
- ▶ Plans based on this guidance must take into consideration that indoor air quality can be polluted, and harmful to health as well
- ▶ Alternatives to outdoor activity must try to achieve as high quality air as possible, including indoor air
- ▶ Background research and analysis of existing outdoor activity advisories conducted by Gita Sinha MD MPH ([www.linkedin.com/in/gita-sinha-5a281bb8](https://www.linkedin.com/in/gita-sinha-5a281bb8))

# The ICARe – 1 Guidance

- ✓ All institutions should have an asthma emergency action plan and kit for addressing immediate needs of children or adults suffering an acute asthma episode.
- ✓ All institutions should provide for immediate attention and referral to a health care provider, for any individual with concerning symptoms, at any time.
- ✓ All institution staff should refer any health related issue IMMEDIATELY to certified medical practitioner, per their institution's health action policies

## CPCB-Defined AQI range and category

Healthy children above 10 years, no underlying medical conditions. Also teachers and healthy adults

Children younger than 10 years, but no underlying medical conditions (4)

Children under 5 years old or any child with medical conditions; and senior citizens(>60 y) and adults with medical conditions.

**0-50**  
Good

*Blue: Intense*



*Blue: Intense*



*Blue: Intense*



**51-100**  
Satisfactory

*Green: Moderate*



*Green: Moderate*



*Orange: Light*



**101-200**  
Moderate

*Orange: Light*



*Orange: Light*



*Red: Mild*



**201-300**  
Poor

*Orange: Light*



*Red: Mild*



*Maroon: Relax*



**301-400**  
Very Poor

*Red: Mild*



*Maroon: Relax*



*Maroon: Relax*



**401+**  
Severe

*Maroon: Relax*



*Maroon: Relax*



*Maroon: Relax*



# Relax

Do not undertake any outdoor physical activity: avoid any increase in breath rate or heart rate

No yoga or pranayama

Avoid even walking or strolling

- ✓ Stay indoors.
- ✓ Monitor the indoor air quality as well.
- ✓ Consider using air purifier or appropriately fitted face mask in indoor environment.
- ✓ Minimal duration of any physical exertion



Maroon

# Mild Activity

Do not raise your breathing rate or your heart rate with physical activity

No athletics, running games and/or sports

No pranayama

- ✓ For most individuals, only undertake very light physical activity
- ✓ Slow walking or strolling if necessary
- ✓ Can undertake light yoga with face mask
- ✓ Use of N95, properly fitting face mask highly recommended
- ✓ Suggested duration of outdoor activity no more than 20 minutes (only for healthy children)



Red



# Light Exercise

Your breathing rate and heart rate can increase, but you should be comfortable talking in a normal conversation during the exercise period.

High intensity sports and games not recommended

- ✓ Can undertake light exercise
- ✓ Can undertake light yoga, physical training etc.
- ✓ Use of N95, properly fitting mask recommended while doing any exercise
- ✓ Suggested duration of outdoor activity no more than 40 minutes



Orange



# Moderate Exercise

Activity should include rest and regular break periods to ensure that the breathing rate and heart rate come to resting levels regularly, throughout the practice period.

No intensive exercise, and avoid highly competitive sports with no breaks, including long distance running, cycling or marathons

- ✓ Can take part in non-intensive and non-competitive games and sports
- ✓ Can undertake low intensity yoga and pranayam
- ✓ Use of N95, properly fitting N95 mask will still be advisable for children who exercise regularly
- ✓ Suggested duration of activities for up to 1-2 hours. For children under 5 years old and children with chronic medical conditions, suggest a more conservative duration of up to 1 hour



Green

# Intense Exercise

No specific restrictions on breathing or heart rate : if you experience any concerning symptoms, rest and seek medical attention

Must be aware of concerning symptoms and rest and/or seek medical attention for any concerns, especially if there are underlying medical conditions

- ✓ Can take part in all competitive games and sports, irrespective of intensity or duration,
- ✓ Any form of athletics or competitive sports can be undertaken as well
- ✓ Consider using an N95 face mask if there are concerns for risk factors such as chronic underlying disease conditions
- ✓ Can exercise for longer periods of time (up to 4 hours)



Blue

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*Maroon: Relax*



*Maroon: Relax*





# N95 Face Masks and Air purifiers: Major Caveats

**\*N95 face masks can be considered for use, but must adhere to the following:**

- ▶ Do not force the use of masks in children with known asthma or asthma symptoms. The use of a mask may increase their risk for asthma symptoms.
- ▶ Mask should be comfortable and well-fitted for all children
- ▶ Should be fitted to adhere tightly around the nose and mouth
- ▶ Should be worn consistently and throughout the duration of outdoor activity
- ▶ Filter or full mask should be changed/cleaned regularly
- ▶ Children wearing a mask must be monitored for proper fit and consistent use throughout any physical exercise
- ▶ If a child feels excessively restricted or uncomfortable breathing with a mask on, for any reason, it may not be suitable for the child. Remove the mask and assess the child for seeking medical attention and alternative activities.

**\*Outdoor air purifiers are NOT EFFECTIVE.**

**\*Indoor Air purifiers may reduce indoor air pollutant levels, but must constantly adhere to the following:**

- ▶ Purifier quantity, size, and capacity is fit to the size of the room
- ▶ Room is kept closed throughout the purification process (including doors and windows)
- ▶ Filters and purifiers are regularly serviced and replaced as needed
- ▶ Adequately ventilate and Monitor indoor air quality for indoor air pollutants: anecdotal evidence suggests increased carbon dioxide levels with use of air conditioners and air purifiers in fully closed rooms

**Even with the use of masks and/or purifiers, institutions must be vigilant for concerning symptoms, and refer immediately to medical care as required.**

# References

## Health harms from air pollution:

- ▶ Liu C et al. Ambient Particulate Air Pollution and Daily Mortality in 652 Cities. N Engl J Med 2019; 381:705-715 DOI: 10.1056/NEJMoa1817364 available at <https://www.nejm.org/doi/full/10.1056/NEJMoa1817364>
- ▶ Qian D, et al. Association of Short-term Exposure to Air Pollution With Mortality in Older Adults. JAMA (Journal of the American Medical Association). 2017;318(24): 2446-2456. doi:10.1001/jama.2017.17923
- ▶ Sinharay R et al. Respiratory and cardiovascular responses to walking down a traffic-polluted road compared with walking in a traffic-free area in participants aged 60 years and older with chronic lung or heart disease and age-matched healthy controls: a randomised, crossover study. Lancet 2018; 391: 339–49.
- ▶ Pasqua LA et al. Exercising in Air Pollution: The Cleanest versus Dirtiest Cities Challenge. Int. J. Environ. Res. Public Health 2018, 15, 1502; doi:10.3390/ijerph15071502.

## Air Quality Standards, Measures, and Reference Points

- ▶ Air Quality Index. Wikipedia. Available at [https://en.wikipedia.org/wiki/Air\\_quality\\_index](https://en.wikipedia.org/wiki/Air_quality_index)
- ▶ Urban Emissions India. Comparing AQI Breakpoints for PM2.5. 2017. Infographic available at [www.urbanemissions.info](http://www.urbanemissions.info)
- ▶ For any information regarding this outdoor activity guidance, please contact: Gita Sinha MD MPH, <[gitasinhamdmph@gmail.com](mailto:gitasinhamdmph@gmail.com)>

**Please note these are general references. Additional information will be shared during presenter sessions.**

# References

## Face Masks and Air Purifiers:

- ▶ Cherrie JW et al. Effectiveness of face masks used to protect Beijing residents against particulate air pollution. *Occup Environ Med.* 2018 Jun; 75(6): 446–452. available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5969371/>
- ▶ Rothman R. Do Air Purifiers Actually Work? <https://www.goodhousekeeping.com/appliances/air-purifier-reviews/a25252001/do-air-purifiers-work/>
- ▶ For additional information regarding usage of air purifiers or face masks, please contact: Jai Dhar Gupta, <[jai@nirvanabeing.com](mailto:jai@nirvanabeing.com)>

**Please note these are general references. Additional information will be shared during presenter sessions.**



## Examples of Outdoor Activity/Health Guidelines in Air Pollution.

- ▶ China Air Quality Guidance. [https://en.wikipedia.org/wiki/Air\\_quality\\_index#Mainland\\_China](https://en.wikipedia.org/wiki/Air_quality_index#Mainland_China)
- ▶ Fremont, California (59.3% Asian/Asian American students, <https://www.kidsdata.org/region/155/fremont-unified/summary#6/demographics>); <https://fremont.gov/598/Mayor>
- ▶ Hong Kong Curriculum Development Institute, Education Bureau. Physical Education Section. Air Quality Health Index (AQHI) School Activities Guidelines. <https://www.edb.gov.hk/en/sch-admin/admin/about-activities/sch-activities-guidelines/index.html>
- ▶ India National Air Quality Standards. available at [https://en.wikipedia.org/wiki/Air\\_quality\\_index#India](https://en.wikipedia.org/wiki/Air_quality_index#India) and [https://cpcb.nic.in/uploads/National\\_Ambient\\_Air\\_Quality\\_Standards.pdf](https://cpcb.nic.in/uploads/National_Ambient_Air_Quality_Standards.pdf)
- ▶ Minnesota Department of Health and the Minnesota Pollution Control Agency. Minnesota Air Quality Guidance for Schools & Child Care Facilities on Poor Air Quality Days for Ozone & Fine Particles. Available at <https://dpi.wi.gov/sites/default/files/imce/sspw/pdf/snairqualityguide.pdf>
- ▶ Montana Department of Environmental Quality. Recommendations for Outdoor Activities Based on Air Quality for Schools and Child Care Facilities. <https://deq.mt.gov/Portals/112/Air/FireUpdates/Documents/Activity%20Guidelines%20for%20Wildfire%20Smoke%20Events.pdf>
- ▶ Singapore Ministry of Health Guidelines for General Public. <https://www.nea.gov.sg/our-services/pollution-control/air-pollution/faqs>
- ▶ United Kingdom Department of Environment Food and Rural Affairs (DEFRA). UK Air Information Resource. Air Quality Guidance. <https://uk-air.defra.gov.uk/air-pollution/daq>
- ▶ United Kingdom Air Pollution Guidance for school staff. <https://neu.org.uk/media/3246/view>
- ▶ United States Environmental Protection Agency (EPA). AirNow. Air Quality and Outdoor Activity Guidance for Schools. [https://cfpub.epa.gov/airnow/index.cfm?action=flag\\_program.outdoorguid](https://cfpub.epa.gov/airnow/index.cfm?action=flag_program.outdoorguid)

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# Thank You

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