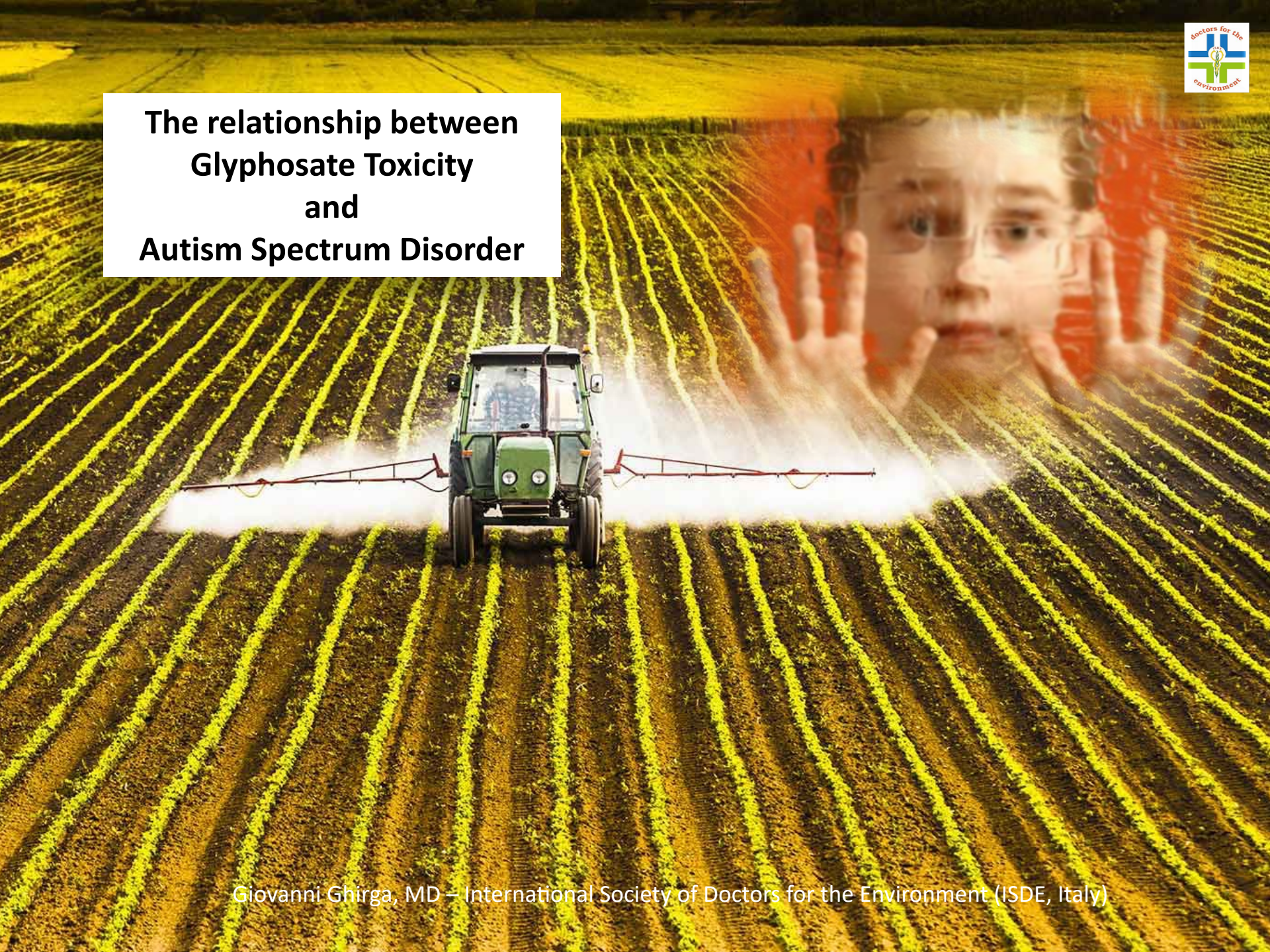
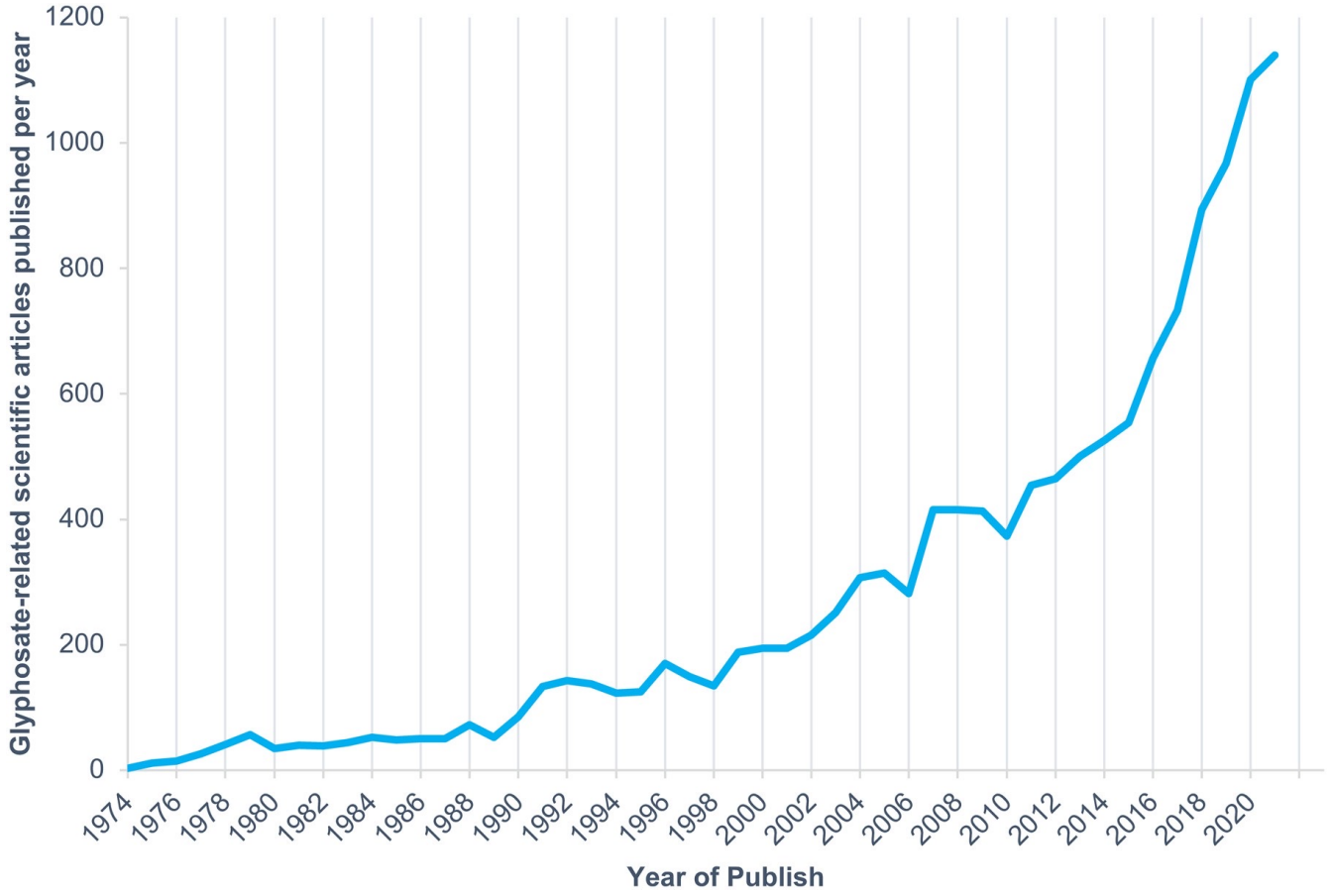
The relationship between Glyphosate Toxicity and Autism Spectrum Disorder

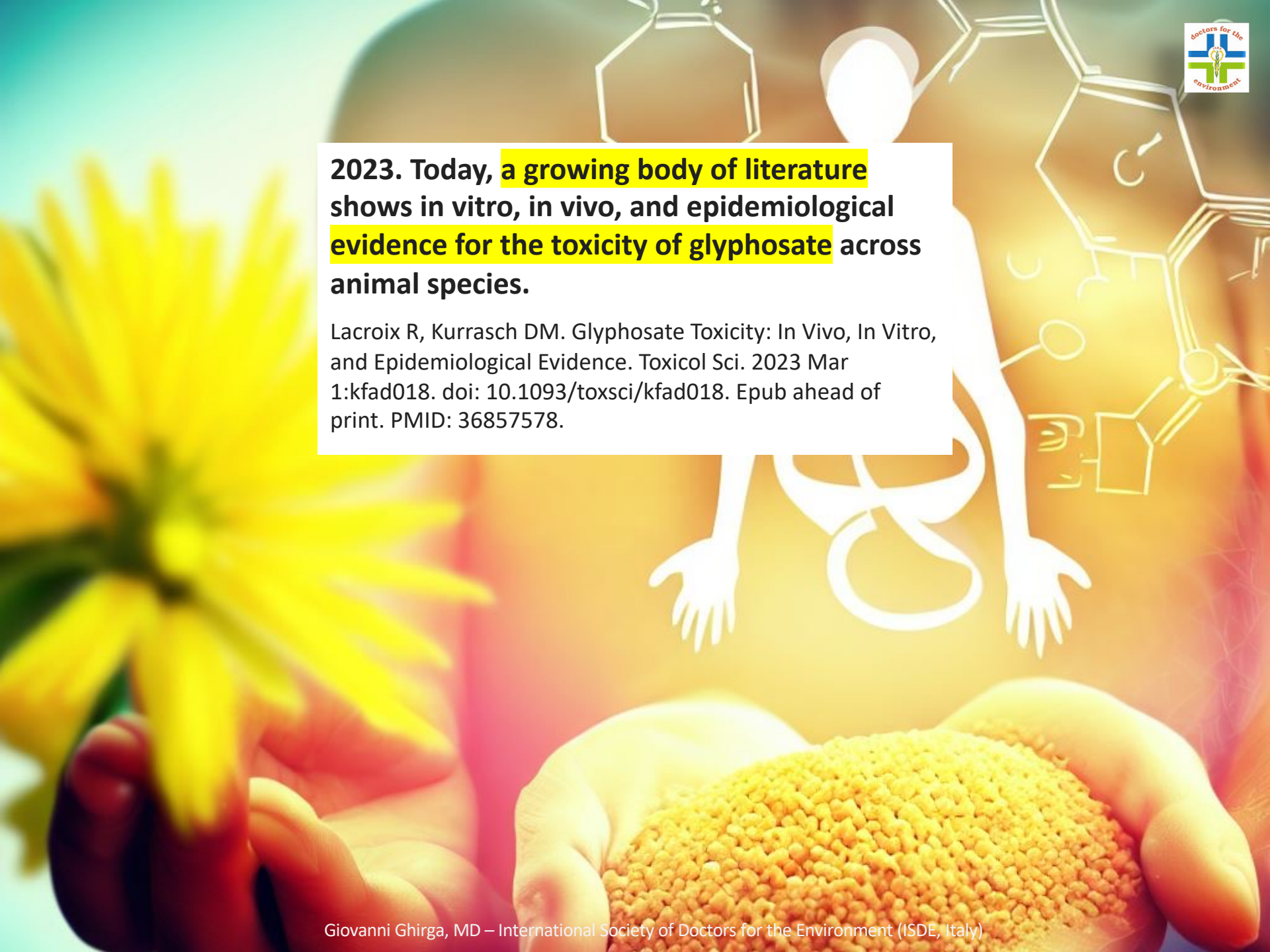


Giovanni Ghirga, MD – International Society of Doctors for the Environment (ISDE, Italy)

Figure 3. Increasing trend of scientific papers published on glyphosate or GBHs from 1974 to 2021. Chart depicting the ...

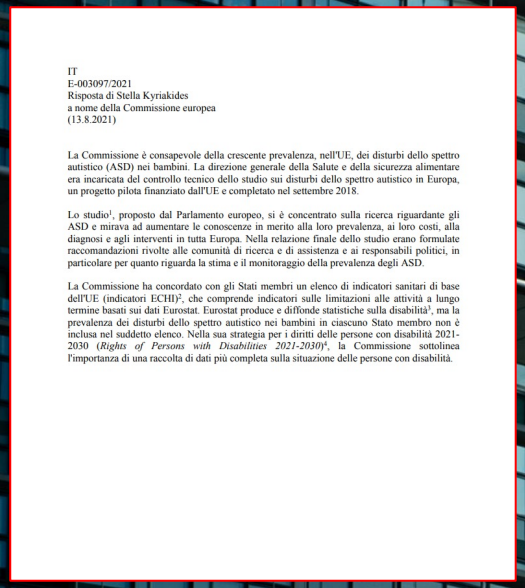


Toxicol Sci, Volume 192, Issue 2, April 2023, Pages 131–140, https://doi.org/10.1093/toxsci/kfad018



2023. Today, a growing body of literature shows in vitro, in vivo, and epidemiological evidence for the toxicity of glyphosate across animal species.

Lacroix R, Kurrasch DM. Glyphosate Toxicity: In Vivo, In Vitro, and Epidemiological Evidence. Toxicol Sci. 2023 Mar 1:kfad018. doi: 10.1093/toxsci/kfad018. Epub ahead of print. PMID: 36857578.



IT
E-003097/2021
Risposta di Stella Kyriakides
a nome della Commissione europea
(13.8.2021)

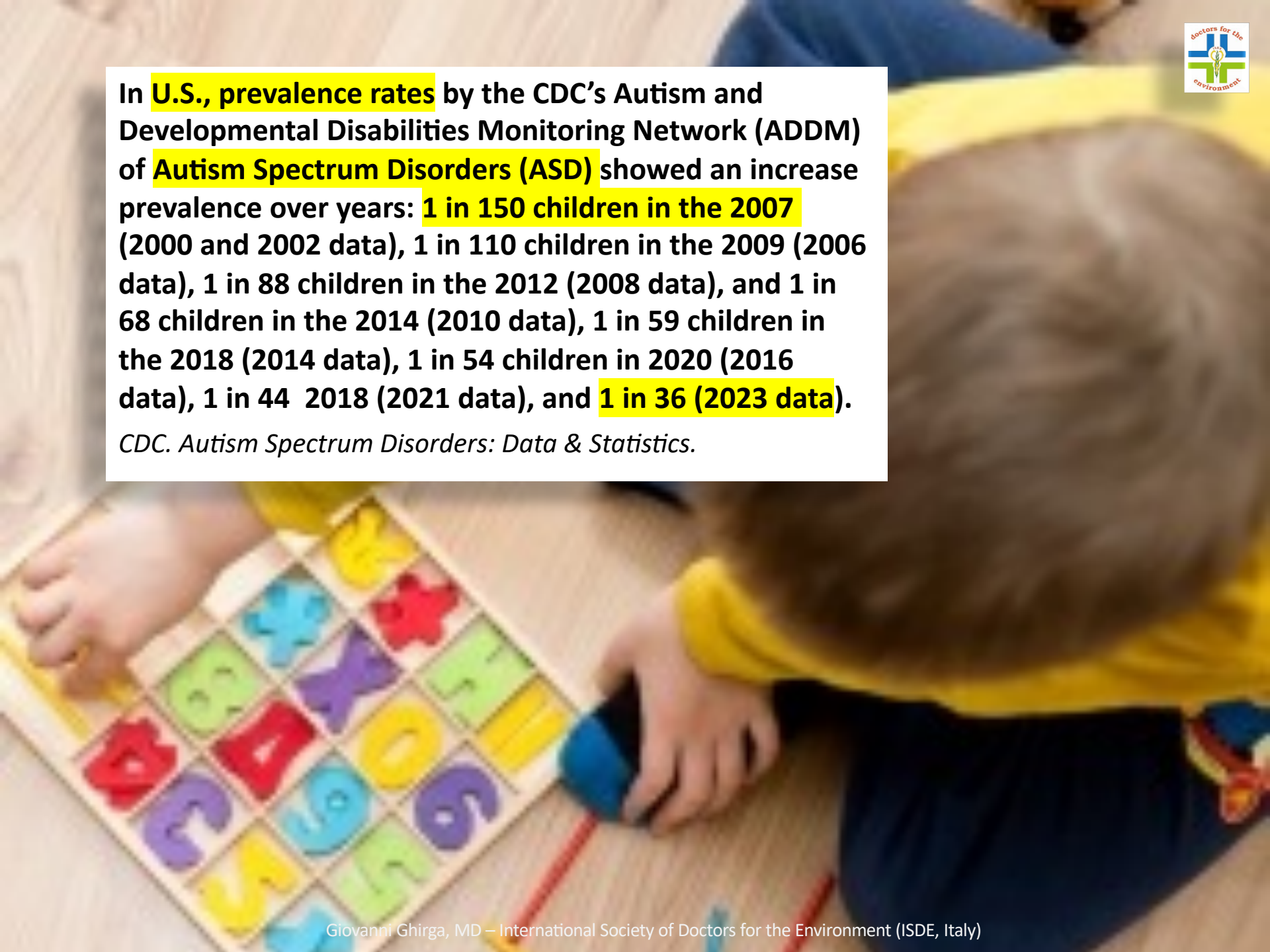
La Commissione è consapevole della crescente prevalenza, nell'UE, dei disturbi dello spettro autistico (ASD) nei bambini. La direzione generale della Salute e della sicurezza alimentare era incaricata del controllo tecnico dello studio sui disturbi dello spettro autistico in Europa, un progetto pilota finanziato dall'UE e completato nel settembre 2018.

Lo studio[1], proposto dal Parlamento europeo, si è concentrato sulla ricerca riguardante gli ASD e mirava ad aumentare le conoscenze in merito alla loro prevalenza, ai loro costi, alla diagnosi e agli interventi in tutta Europa. Nella relazione finale dello studio erano formulate raccomandazioni rivolte alle comunità di ricerca e di assistenza e ai responsabili politici, in particolare per quanto riguarda la stima e il monitoraggio della prevalenza degli ASD.

La Commissione ha concordato con gli Stati membri un elenco di indicatori sanitari di base dell'UE (indicatori ECHI)[2], che comprende indicatori sulle limitazioni alle attività a lungo termine basati sui dati Eurostat. Eurostat produce e diffonde statistiche sulla disabilità[3], ma la prevalenza dei disturbi dello spettro autistico nei bambini in ciascuno Stato membro non è inclusa nel suddetto elenco. Nella sua strategia per i diritti delle persone con disabilità 2021-2030 (*Rights of Persons with Disabilities 2021-2030*)[4], la Commissione sottolinea l'importanza di una raccolta di dati più completa sulla situazione delle persone con disabilità.

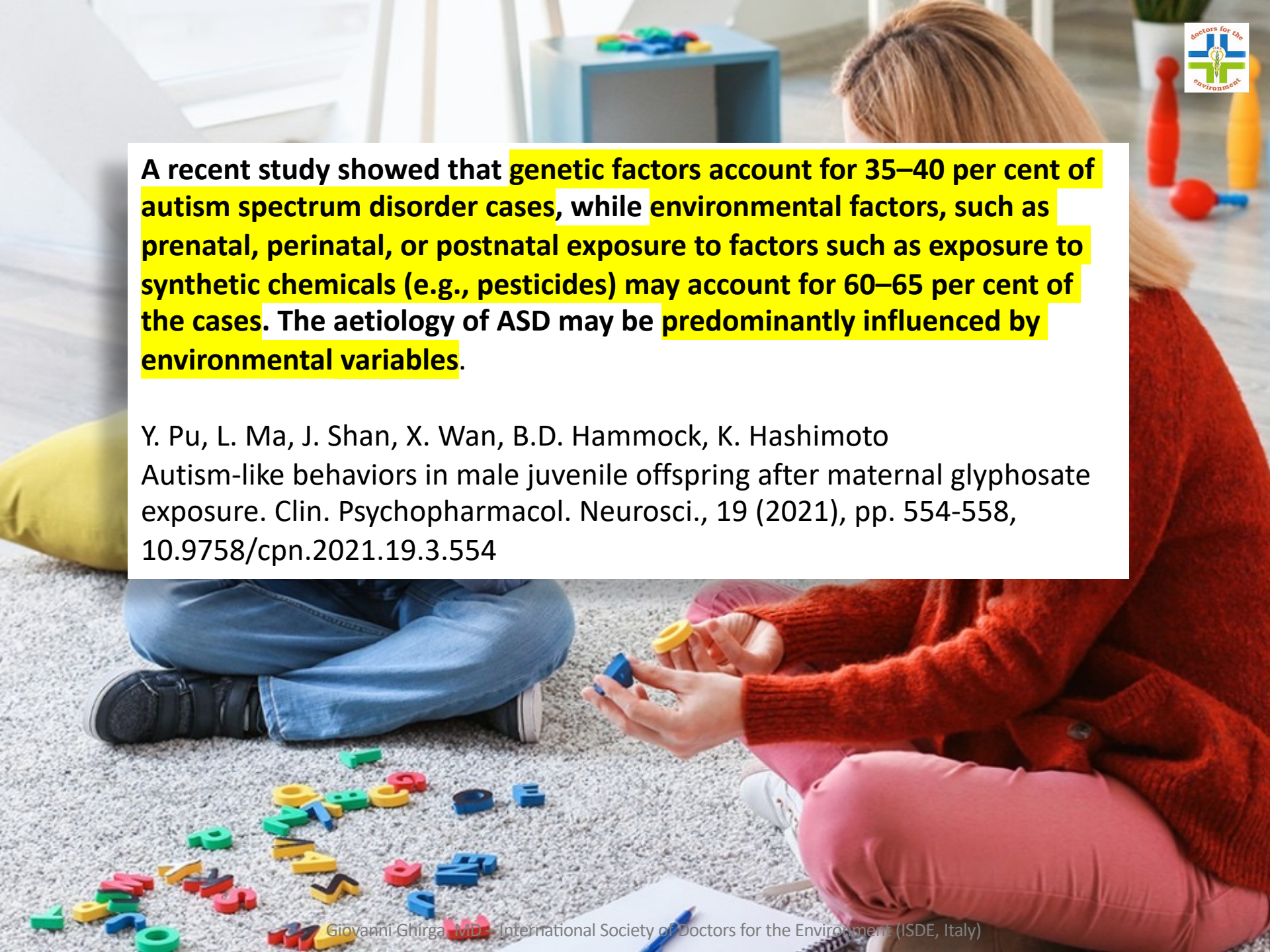
The European Commission is aware of the increasing prevalence in the EU of autism spectrum disorders in children. Its Directorate-General for Health and Food Safety was in charge of the technical follow up of the study on Autism Spectrum Disorders (ASD) in Europe. Evidence from recent international studies shows that there has been a rapid and widespread increase in the prevalence of autism spectrum disorders, which now affect some 5 million people in Europe.
According to a recent study by Autism Spectrum Disorders in Europe (ASDEU) on the prevalence of autism in 11 Member States, around 1 child in 89 has ASD. Even more alarming, according to the Italian National Institute of Health, the figure is 1 child in 77 in Italy, in other words, autism directly affects at least 500.000 households.

Ms Kyriakides on behalf of the European Commission. Answer to question E-003097/2021 to the Commission Rule 138. Chiara Gemma (NI), Tiziana Beghin (NI), Laura Ferrara (NI), Daniela Rondinelli (NI), Mario Furore (NI), Dino Giarrusso (NI), Fabio Massimo Castaldo (NI) given by 13.8.2021



In U.S., prevalence rates by the CDC's Autism and Developmental Disabilities Monitoring Network (ADDM) of Autism Spectrum Disorders (ASD) showed an increase prevalence over years: 1 in 150 children in the 2007 (2000 and 2002 data), 1 in 110 children in the 2009 (2006 data), 1 in 88 children in the 2012 (2008 data), and 1 in 68 children in the 2014 (2010 data), 1 in 59 children in the 2018 (2014 data), 1 in 54 children in 2020 (2016 data), 1 in 44 2018 (2021 data), and 1 in 36 (2023 data).

CDC. Autism Spectrum Disorders: Data & Statistics.



A recent study showed that genetic factors account for 35–40 per cent of autism spectrum disorder cases, while environmental factors, such as prenatal, perinatal, or postnatal exposure to factors such as exposure to synthetic chemicals (e.g., pesticides) may account for 60–65 per cent of the cases. The aetiology of ASD may be predominantly influenced by environmental variables.

Y. Pu, L. Ma, J. Shan, X. Wan, B.D. Hammock, K. Hashimoto
Autism-like behaviors in male juvenile offspring after maternal glyphosate exposure. Clin. Psychopharmacol. Neurosci., 19 (2021), pp. 554-558, 10.9758/cpn.2021.19.3.554

A 2022 systematic review on "Toxic Effects of Glyphosate on the Nervous System" concludes that it is unequivocal that exposure to glyphosate, the most widely used herbicide in the world, produces important alterations in the structure and function of the nervous system of humans, rodents, fish, and invertebrates.

Costas-Ferreira C, Durán R, Faro LRF. Toxic Effects of Glyphosate on the Nervous System: A Systematic Review. Int J Mol Sci. 2022 Apr 21;23(9):4605. doi: 10.3390/ijms23094605. PMID: 35562999; PMCID: PMC9101768.

There is scientific evidence concerning the exposure to glyfosate in early life and the development of the autism spectrum disorder.

- O.S. von Ehrenstein, C. Ling, X. Cui, M. Cockburn, A.S. Park, F. Yu, J. Wu, B. Ritz. **Prenatal and infant exposure to ambient pesticides and autism spectrum disorder in children: population based case-control study.** BMJ (2019), p. l962, 10.1136/bmj.l962

- I.Md Meftaul, K. Venkateswarlu, R. Dharmarajan, P. Annamalai, M. Asaduzzaman, A. Parven, M. Megharaj
Controversies over human health and ecological impacts of glyphosate: Is it to be banned in modern agriculture
Environ. Pollut., 263 (2020), Article 114372, 10.1016/j.envpol.2020.114372

- J.S. Ongono, R. Béranger, A. Baghdadli, M. Mortamais
Pesticides used in Europe and autism spectrum disorder risk: can novel exposure hypotheses be formulated beyond organophosphates, organochlorines, pyrethroids and carbamates? - a systematic review
Environ. Res., 187 (2020), Article 109646, 10.1016/j.envres.2020.109646

- M.A.L. de Oliveira, V.C.T. Rojas, J.C. de Sá, C.O. de Novais, M.S. Silva, H.A. de Almeida Paula, T.B. Kirsten, M.M. Bernardi, L.C. Pinheiro, A. Giusti-Paiva, F.C. Vilela
Perinatal exposure to glyphosate-based herbicides induced neurodevelopmental behaviors impairments and increased oxidative stress in the prefrontal cortex and hippocampus in offspring
Int. J. Dev. Neurosci., 82 (2022), pp. 528-538, 10.1002/jdn.10207

- Y. Pu, L. Ma, J. Shan, X. Wan, B.D. Hammock, K. Hashimoto Autism-like behaviors in male juvenile offspring after maternal glyphosate exposure Y. Pu, L. Ma, J. Shan, X. Wan, B.D. Hammock, K. Hashimoto
Autism-like behaviors in male juvenile offspring after maternal glyphosate exposure
Clin. Psychopharmacol. Neurosci., 19 (2021), pp. 554-558, 10.9758/cpn.2021.19.3.554

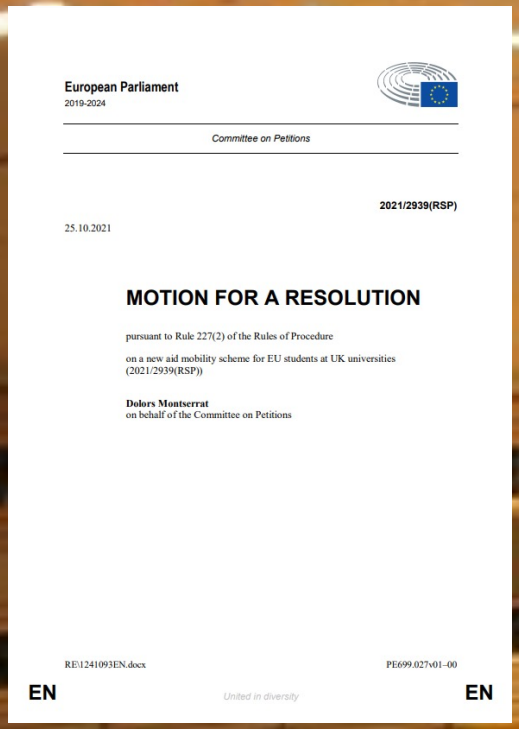
- Bertoletti ACC, Peres KK, Faccioli LS, Vacci MC, da Mata IR, Kuyven CJ, Dal Bosco SM. Early exposure to agricultural pesticides and the occurrence of autism spectrum disorder: a systematic review. Rev Paul Pediatr. 2023;41:e2021360. doi:10.1590/1984-0462/2023/41/2021360. PMID: 36102405.

Recent studies have highlighted that the development or severity of ASD associated to glycosate exposure may be linked to gut microbiota dysbiosis.

- Yang, Y., Zhou, S., Xing, Y., Yang, G., & You, M. (2023). Impact of Pesticides Exposure During Neurodevelopmental Period on Autism Spectrum Disorders - An Insight into Gut Microbiota. Ecotoxicology and Environmental Safety, 260, 115079.

- S. Zhu, Y. Jiang, K. Xu, M. Cui, W. Ye, G. Zhao, L. Jin, X. Chen
The progress of gut microbiome research related to brain disorders. Neuroinflamm., 17 (2020), p. 25, 10.1186/s12974-020-1705-z.

- Yang Y, Zhou S, Xing Y. Impact of pesticides exposure during neurodevelopmental period on autism spectrum disorders – A focus on gut microbiota. Ecotoxicology and Environmental Safety. 2023;260:115079.



European Parliament
2019-2024

Committee on Petitions

2021/2939(RSP)

25.10.2021

MOTION FOR A RESOLUTION

pursuant to Rule 227(2) of the Rules of Procedure

on a new aid mobility scheme for EU students at UK universities (2021/2939(RSP))

Dolors Montserrat
on behalf of the Committee on Petitions

RE\1241093EN.docx PE699.027v01-00

EN *United in diversity* EN

The European Parliament has officially pledged to protect the rights of individuals living with autism spectrum disorder. It is now incumbent upon the European Commission to affirm the stance of the European Parliament by banning substances such as glyphosate, which studies suggest may increase risk of autism, possibly due to effects on gut microbiota.

The precautionary principle should guide actions particularly when there is a threat to children's mental health.

Montserrat D. DRAFT MOTION FOR A RESOLUTION pursuant to Rule 227(2) of the Rules of Procedure on harmonising the rights of autistic persons (2023/2728(RSP)). Presented on behalf of the Committee on Petitions; 2023.