

MEDIA RELEASE • COMMUNIQUE AUX MEDIAS • MEDIENMITTEILUNG

Global study by Novartis and European Migraine and Headache Alliance reveals 60% of employed people with severe migraine miss, on average, a week of work per month

- *Study reveals migraine causes significant disruption to daily life and work, which could be managed with better preventive treatments and workplace solutions*
- *Migraine is estimated to cost up to €27 billion in Europe and around \$20 billion in the US annually, including indirect costs such as lost productivity*
- *My Migraine Voice is the largest ever global study of people living with migraine, involving more than 11,000 people from 31 countries*

Basel, June 27, 2018 – Novartis and the European Migraine and Headache Alliance (EMHA) today announced initial findings from the largest global migraine patient study to date, involving over 11,000 people from 31 countries. Migraine is a neurological disease which can vary in severity with symptoms ranging from head pain, nausea, vomiting to sensitivity to light. The *My Migraine Voice* study included people who had at least four migraine days per month with nearly 90% having tried at least one preventive treatment. The findings, presented at the 60th Annual Scientific Meeting of the American Headache Society (AHS) in San Francisco, reveal that migraine cuts work productivity by half¹. On average, 60% of employed respondents missed almost a full working week (4.6 days) due to migraine in the last month.

Additionally, the *My Migraine Voice* study examined the impact of migraine on overall work impairment, including reduced productivity while at work (presenteeism) and work time missed due to migraine (absenteeism) using the Work Productivity and Activity Impairment (WPAI) questions. Those who had worked in the last week reported that their overall work productivity was cut by over half (53% reduction), with this figure rising to 56% for those with two or more preventive treatment failures.

“Migraine is often dismissed as just a bad headache. These results shed light on an invisible, yet debilitating disease,” said Elena Ruiz de la Torre, Executive Director and Immediate Past President of European Migraine and Headache Alliance. “Despite living with such an incapacitating condition, people living with migraine strive to be very productive but need better relief from symptoms, and support in the workplace to ensure they can achieve their full potential. The EMHA is involved in a number of initiatives that are committed to this cause.”

Despite the devastating impact of migraine, employed respondents shared that although the majority of their employers (63%) knew about their migraine, only 18% offered support². Further, many said they feel judged, stigmatized or misunderstood for taking days off, illustrating the need for awareness and support in the workplace. To help combat this and empower associates living with migraine to better manage their disease, Novartis Switzerland has launched a pilot program which includes, among other services, free coaching and access to an exclusive version of the Migraine Buddy[®] platform, developed and owned by Healint. Novartis is also exploring opportunities to work with other employers who are interested in supporting their associates living with migraine.

“We would like to take this opportunity to thank the participants who took the time to share their experiences with us. At Novartis, it is our mission to actively listen to people around the world to address their needs,” said Shreeram Aradhye, Chief Medical Officer and Global Head Medical Affairs, Novartis Pharmaceuticals. “The findings from the *My Migraine Voice* study clearly illustrate the need for more effective treatments and a holistic management approach for people living with migraine. We are committed to providing new preventive therapies and inventive solutions, including education, telecoaching and apps, to help people with migraine overcome the challenges they may face in their lives and at work.”

Migraine often occurs during peak productive years, between the ages of 35 and 45 and often results in temporary disability during attacks. Affected people can be incapacitated by the symptoms which can last for days. Migraine is costly to society with the overall costs estimated to range between €18-27 billion across Europe^{3,4} and about \$20 billion in the US^{5,6}.

Further results on the physical and economic burden of migraine will be released at upcoming medical meetings, and the findings from the study are being prepared for submission to peer-reviewed journals.

About My Migraine Voice study

The *My Migraine Voice* study was a global study assessing the worldwide migraine burden from the patient’s perspective^{1,2}. Data was collected via a 30-minute online questionnaire fielded in 31 countries between September 2017 and February 2018. The study questions covered the social, economic and emotional impact of the disease, the real-life experience of an individual living with migraine and their journey through the healthcare system and employment environment. Study participants were 11,266 adults (aged 18 years or older) who had experienced at least four migraine days each month in the last three months and self-reported having been diagnosed with migraine by a medical professional. Of those recruited, 90% had experience of at least one preventive treatment and of these, 80% had to change their treatment one or more times.

Participants were recruited via online panels in all countries. In 11 countries, some participants were recruited through patient advocacy organizations (Belgium, Canada, Denmark, Finland, Germany, Ireland, Netherlands, Russia, Sweden, Taiwan, the UK). In France, people living with migraine were also recruited through the Migraine Buddy[®] platform.

Three-quarters of the study respondents were women, reflecting a commonly seen pattern of migraine. The average age of respondents was 39¹. Fifty six percent were married and 73% reported that they were either full-time, part-time or self-employed or studying². The study highlighted the chronic nature of migraine, with more than one in three respondents (37%) reporting they have been affected for 16 or more years².

The study was initiated and funded by Novartis and the European Migraine and Headache Alliance, guided by a steering committee including people living with migraine, neurologists and patient advocacy organizations. It was conducted by the market research company GfK Health Switzerland. Full results of the study will be released at scientific congresses in 2018 and in peer-reviewed publications.

About Novartis’ Commitment to People Living with Migraine

Through support and education, we aim to challenge public perception of migraine, assist people in getting the treatment they need and facilitate informed communication among people with migraine and those who live and work with them, including co-workers and employers.

The Migraine Care program is a pilot program created by Novartis, in collaboration with patient groups and leading experts in neurology, telemedicine and digital, to provide a complimentary service for all Swiss Novartis associates and their immediate family members living with migraine to improve their quality of life. The program aims to raise awareness of migraine in the workplace and provide free coaching to Novartis associates living with migraine to empower them in the management of the disease.

As part of the program, Novartis associates will have access to an exclusive version of the Migraine Buddy[®] mobile application, the world's largest migraine tracking and research platform, currently used by more than one million people living with migraine globally. The app enables people living with migraine to better understand their condition, and have the ability to share fact-based reports about their symptoms and history with their physicians. Novartis and Healint[®], the developer of Migraine Buddy[®], have a global alliance which includes joint support of the Migraine Buddy[®] mobile application to improve the patient-physician conversation, and ultimately, patient care.

Novartis is also committed to working with the migraine community around the world to discover new ways to improve care for people living with the disease. The European Migraine and Headache Alliance (EMHA) is a non-profit, patient umbrella group which was launched in 2006 and represents 28 patient groups from across the continent. EMHA is an active member of the European Federation of Neurological Alliances, the International Association of Patient Organizations and the European Patients Forum. The EMHA works closely with organizations such as the European Headache Federation, the European Brain Council and others. Only by working together can we improve outcomes for people living with migraine.

* Migraine Buddy[®] is an application owned and run by Healint Pte. Ltd.

About Migraine

Migraine is a distinct neurological disease⁷. It involves recurrent attacks of moderate to severe head pain that is typically pulsating, often unilateral and associated with nausea, vomiting and sensitivity to light, sound and odors⁸. Migraine is associated with personal pain, disability and reduced quality of life, and financial cost to society⁹. It has a profound and limiting impact on an individual's abilities to carry out everyday tasks and was declared by the World Health Organization to be one of the top 10 causes of years lived with disability for men and women¹⁰. It remains under-recognized and under-treated^{9,11}. Existing preventive therapies have been repurposed from other indications and are often associated with poor tolerability and lack of efficacy, with high discontinuation rates among patients¹².

Disclaimer

This press release contains forward-looking statements within the meaning of the United States Private Securities Litigation Reform Act of 1995. Forward-looking statements can generally be identified by words such as "potential," "can," "will," "plan," "expect," "anticipate," "look forward," "believe," "committed," "investigational," "pipeline," "launch," or similar terms, or by express or implied discussions regarding potential marketing approvals, new indications or labeling for the investigational or approved products described in this press release, or regarding potential future revenues from such products. You should not place undue reliance on these statements. Such forward-looking statements are based on our current beliefs and expectations regarding future events, and are subject to significant known and unknown risks and uncertainties. Should one or more of these risks or uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those set forth in the forward-looking statements. There can be no guarantee that the investigational or approved products described in this press release will be submitted or approved for sale or for any additional indications or labeling in any market, or at any particular time. Nor can there be any guarantee that such products will be commercially successful in the future. In particular,

our expectations regarding such products could be affected by, among other things, the uncertainties inherent in research and development, including clinical trial results and additional analysis of existing clinical data; regulatory actions or delays or government regulation generally; global trends toward health care cost containment, including government, payor and general public pricing and reimbursement pressures; our ability to obtain or maintain proprietary intellectual property protection; the particular prescribing preferences of physicians and patients; general political and economic conditions; safety, quality or manufacturing issues; potential or actual data security and data privacy breaches, or disruptions of our information technology systems, and other risks and factors referred to in Novartis AG's current Form 20-F on file with the US Securities and Exchange Commission. Novartis is providing the information in this press release as of this date and does not undertake any obligation to update any forward-looking statements contained in this press release as a result of new information, future events or otherwise.

About Novartis

Novartis provides innovative healthcare solutions that address the evolving needs of patients and societies. Headquartered in Basel, Switzerland, Novartis offers a diversified portfolio to best meet these needs: innovative medicines, cost-saving generic and biosimilar pharmaceuticals and eye care. Novartis has leading positions globally in each of these areas. In 2017, the Group achieved net sales of USD 49.1 billion, while R&D throughout the Group amounted to approximately USD 9.0 billion. Novartis Group companies employ approximately 124,000 full-time-equivalent associates. Novartis products are sold in approximately 155 countries around the world. For more information, please visit <http://www.novartis.com>.

Novartis is on Twitter. Sign up to follow @Novartis at <http://twitter.com/novartis>
For Novartis multimedia content, please visit www.novartis.com/news/media-library
For questions about the site or required registration, please contact media.relations@novartis.com

References

1. Schwedt TJ, Vo P, Fink R et al. Work productivity amongst those with migraine: results from the My Migraine Voice survey. Abstract presented at the 60th Annual Scientific Meeting of the American Headache Society (AHS), San Francisco, CA, USA, June 28-July 1, 2018.
2. Data on file. Novartis, 2018.
3. Olesen J, et al., and CDBE2010 study group; European Brain Council. The economic cost of brain disorders in Europe. *Eur J Neurol*. 2012 Jan;19(1):155-62.
4. Stovner LJ, Andr e C; Eurolight Steering Committee. Impact of headache in Europe: a review for the Eurolight project. *J Headache Pain*. 2008 Jun;9(3):139-46.
5. Hawkins K, Wang S, Rupnow MF. Indirect cost burden of migraine in the United States. *J Occup Environ Med*. 2007;49(4):368-374.
6. Hawkins K, Wang S, Rupnow MF. Direct cost burden among insured US employees with migraine. *Headache*. 2007;48(4):553-563.
7. Migraine Research Foundation. Migraine Fact Sheet. 2015. <http://www.migraineresearchfoundation.org/fact-sheet.html>. Accessed April 2018
8. National Institute for Neurological Disorders and Stroke. <https://www.ninds.nih.gov/Disorders/All-Disorders/Migraine-Information-Page> (link is external). Accessed June 2018
9. World Health Organisation Factsheet on Headache Disorders. <http://www.who.int/news-room/factsheets/detail/headache-disorders> Accessed June 2018.
10. Global Health Estimates 2015: Disease burden by Cause, Age, Sex, by Country and by Region, 2000-2015. Geneva, World Health Organization; 2016.
11. Diamond S et al. Patterns of Diagnosis and Acute and Preventive Treatment for Migraine in the United States: Results from the American Migraine Prevalence and Prevention Study. *Headache*. 2007;47(3):355-63.
12. Blumenfeld AM et al. Patterns of use and reasons for discontinuation of prophylactic medications for episodic migraine and chronic migraine: results from the second international burden of migraine study (IBMS-II). *Headache*. 2013 Apr;53(4):644-55.

Novartis Media Relations

Central media line: +41 61 324 2200

E-mail: media.relations@novartis.com

Eric Althoff

Novartis Global Media Relations

+41 61 324 7999 (direct)

+41 79 593 4202 (mobile)

eric.althoff@novartis.com

Angela Fiorin

Novartis Global Pharma Communications

+41 61 324 8631 (direct)

+41 79 752 6955 (mobile)

angela.fiorin@novartis.com

Novartis Investor Relations

Central investor relations line: +41 61 324 7944

E-mail: investor.relations@novartis.com

Central

Samir Shah

+41 61 324 7944

Pierre-Michel Bringer

+41 61 324 1065

Thomas Hungerbuehler

+41 61 324 8425

Isabella Zinck

+41 61 324 7188

North America

Richard Pulik

+1 212 830 2448

Cory Twining

+1 212 830 2417