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# Pfizer and BioNTech Submit for U.S. Emergency Use Authorization of an Additional Booster Dose of their COVID-19 Vaccine for Older Adults

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- *Submission based on real-world safety and efficacy data from Israel*
- *Data showed rates of confirmed infections were 2 times lower and rates of severe illness were 4 times lower among individuals who received an additional booster dose of Pfizer-BioNTech COVID-19 Vaccine compared to individuals who received only an initial booster*

**NEW YORK and MAINZ, GERMANY, MARCH 15, 2022** — Pfizer Inc. (NYSE: PFE) and BioNTech SE (Nasdaq: BNTX) today announced the companies have submitted an application to the U.S. Food and Drug Administration (FDA) for Emergency Use Authorization (EUA) of an additional booster dose for adults 65 years of age and older who have received an initial booster of any of the authorized or approved COVID-19 vaccines. The submission is based on two real-world data sets from Israel analyzed at a time when the Omicron variant was widely circulating. These data showed evidence that an additional mRNA booster increases immunogenicity and lowers rates of confirmed infections and severe illness.

An analysis of Israeli Ministry of Health records was conducted for over 1.1 million adults 60 years of age and older who had no known history of SARS-CoV-2 infection and were eligible for an additional (fourth dose) booster. These data showed rates of confirmed infections were 2 times lower and rates of severe illness were 4 times lower among individuals who received an additional booster dose of the Pfizer-BioNTech COVID-19 Vaccine administered at least four months after an initial booster (third) dose compared to those who received only one booster dose.

Also included in the submission are results from an ongoing, open-label, non-randomized clinical trial in healthcare workers 18 years of age and older at a single study center in Israel who had been vaccinated with three doses of the Pfizer-BioNTech COVID-19 Vaccine. Among the 154 (out of 700) participants who received an additional booster (fourth) dose of the Pfizer-BioNTech COVID-19 Vaccine at least four months following the initial booster, neutralizing antibody titers increased approximately 7-fold to 8-fold at two and three weeks after the additional booster (fourth) dose compared to five months after the initial booster (third) dose. Additionally, there was an 8-fold and 10-fold increase in neutralizing antibody titers against the Omicron variant (B.1.1.529) at one and two weeks after the additional booster dose, respectively, compared to five months after the initial booster. The study also revealed no new safety concerns in individuals who received an additional booster dose of the vaccine.

Emerging evidence, including data from Kaiser Permanente Southern California (KPSC), suggests that effectiveness against both symptomatic COVID-19 [1,2,3,4,5] and severe disease[1,5] caused by Omicron wanes 3 to 6 months after receipt of an initial booster (third) dose. Thus, additional booster doses may be needed to

ensure individuals remain adequately protected. The data being reviewed by the FDA from Israel suggest that an additional booster dose of the Pfizer-BioNTech COVID-19 Vaccine administered at least 4 months after an initial booster dose could restore antibody titers to peak post-third dose titer levels, [7] improve protection against both infection and severe disease in individuals 60 years of age and older in Israel,[7] and have a similar safety profile to that of previous doses.[6] The data from KPSC were provided to the FDA as an example of waning of the Pfizer-BioNTech COVID-19 Vaccine, but have not been reviewed by the agency.

The Pfizer-BioNTech COVID-19 Vaccine is currently authorized as a single booster dose administered at least five months after completion of a primary series of the Pfizer-BioNTech COVID-19 Vaccine or COMIRNATY® (COVID-19 Vaccine, mRNA) to individuals 12 years of age and older. A single booster dose can also be administered to individuals 18 years of age and older who have completed primary vaccination with another authorized or approved COVID-19 Vaccine. Clinical and real-world data continue to show that people who are vaccinated, particularly those who have received a booster, maintain a high level of protection, particularly against severe disease and hospitalization. The companies remain vigilant and continue to collect data to explore new vaccine approaches and regimens to reduce the risk of infection and the risk of severe COVID-19 disease.

The Pfizer-BioNTech COVID-19 Vaccine, which is based on BioNTech's proprietary mRNA technology, was developed by both BioNTech and Pfizer. BioNTech is the Marketing Authorization Holder in the United States, the European Union, the United Kingdom, Canada and the holder of emergency use authorizations or equivalents in the United States (jointly with Pfizer) and other countries. Submissions to pursue regulatory approvals in those countries where emergency use authorizations or equivalent were initially granted are planned.

**U.S. Indication & Authorized Use**

HOW IS THE VACCINE GIVEN?

The vaccine will be given as an injection into the muscle.

Primary Series:
In individuals 5 years of age and older, the vaccine is administered as a 2-dose series, 3 weeks apart. In individuals 5 years of age and older, a third primary series dose may be administered at least 28 days after the second dose to individuals who are determined to have certain kinds of immunocompromise.

Booster Dose:
- A single booster dose of the vaccine may be administered at least 5 months after completion of a primary series of the Pfizer-BioNTech COVID-19 Vaccine or COMIRNATY® (COVID-19 Vaccine, mRNA) to individuals 12 years of age and older
- A single booster dose of the vaccine may be administered to individuals 18 years of age and older who have completed primary vaccination with another authorized or approved COVID-19 vaccine. Individuals should check with their healthcare provider regarding timing of the booster dose

WHAT IS THE INDICATION AND AUTHORIZED USE?

The Pfizer-BioNTech COVID-19 Vaccine has received EUA from FDA to provide:
- a 2-dose primary series to individuals 5 years of age and older
- a third primary series dose to individuals 5 years of age and older who have been determined to have certain kinds of immunocompromise
- a single booster dose to individuals 12 years of age and older who have completed a primary series with

Pfizer-BioNTech COVID-19 Vaccine or COMIRNATY® (COVID-19 Vaccine, mRNA)
- a single booster dose to individuals 18 years of age and older who have completed primary vaccination with another authorized or approved COVID-19 vaccine. The booster schedule is based on the labeling information of the vaccine used for the primary series

COMIRNATY® (COVID-19 Vaccine, mRNA) is an FDA-approved COVID-19 vaccine made by Pfizer for BioNTech.
- It is approved as a 2-dose series for prevention of COVID-19 in individuals 16 years of age and older
- It is also authorized under EUA to provide:
  - a 2-dose primary series to individuals 12 through 15 years of age
  - a third primary series dose to individuals 12 years of age and older who have been determined to have certain kinds of immunocompromise
  - a single booster dose to individuals 12 years of age and older who have completed a primary series with Pfizer-BioNTech COVID-19 Vaccine or COMIRNATY® (COVID-19 Vaccine, mRNA)

a single booster dose to individuals 18 years of age and older who have completed primary vaccination with another authorized or approved COVID-19 vaccine. The booster schedule is based on the labeling information of the vaccine used for the primary series

**EUA Statement**

Emergency uses of the vaccine have not been approved or licensed by FDA, but have been authorized by FDA, under an Emergency Use Authorization (EUA) to prevent Coronavirus Disease 2019 (COVID-19) in individuals 5 years of age and older. The emergency uses are only authorized for the duration of the declaration that circumstances exist justifying the authorization of emergency use of the medical product under Section 564(b)(1) of the FD&C Act unless the declaration is terminated, or authorization revoked sooner. Please see EUA Fact Sheet at www.cvdvaccine-us.com.

**IMPORTANT SAFETY INFORMATION**

Individuals should not get the vaccine if they:
- had a severe allergic reaction after a previous dose of this vaccine
- had a severe allergic reaction to any ingredient of this vaccine

Individuals should tell the vaccination provider about all of their medical conditions, including if they:
- have any allergies
- have had myocarditis (inflammation of the heart muscle) or pericarditis (inflammation of the lining outside the heart)
- have a fever
- have a bleeding disorder or are on a blood thinner
- are immunocompromised or are on a medicine that affects the immune system
- are pregnant, plan to become pregnant, or are breastfeeding
- have received another COVID-19 vaccine
- Have ever fainted in association with an injection

The vaccine may not protect everyone.

Side effects reported with the vaccine include:
- There is a remote chance that the vaccine could cause a severe allergic reaction
  - A severe allergic reaction would usually occur within a few minutes to 1 hour after getting a dose of the vaccine. For this reason, vaccination providers may ask individuals to stay at the place where they received the

vaccine for monitoring after vaccination
o Signs of a severe allergic reaction can include difficulty breathing, swelling of the face and throat, a fast heartbeat, a bad rash all over the body, dizziness, and weakness
o If an individual experiences a severe allergic reaction, they should call 9-1-1 or go to the nearest hospital

• Myocarditis (inflammation of the heart muscle) and pericarditis (inflammation of the lining outside the heart) have occurred in some people who have received the vaccine, more commonly in males under 40 years of age than among females and older males. In most of these people, symptoms began within a few days following receipt of the second dose of the vaccine. The chance of having this occur is very low. Individuals should seek medical attention right away if they have any of the following symptoms after receiving the vaccine:
o chest pain
o shortness of breath
o feelings of having a fast-beating, fluttering, or pounding heart

• Additional side effects that have been reported with the vaccine include:
o severe allergic reactions; non-severe allergic reactions such as rash, itching, hives, or swelling of the face; myocarditis (inflammation of the heart muscle); pericarditis (inflammation of the lining outside the heart); injection site pain; tiredness; headache; muscle pain; chills; joint pain; fever; injection site swelling; injection site redness; nausea; feeling unwell; swollen lymph nodes (lymphadenopathy); decreased appetite; diarrhea; vomiting; arm pain; fainting in association with injection of the vaccine

• These may not be all the possible side effects of the vaccine. Serious and unexpected side effects may occur. The possible side effects of the vaccine are still being studied in clinical trials. Call the vaccination provider or healthcare provider about bothersome side effects or side effects that do not go away

Data on administration of this vaccine at the same time as other vaccines have not yet been submitted to FDA. Individuals considering receiving this vaccine with other vaccines should discuss their options with their healthcare provider.

Patients should always ask their healthcare providers for medical advice about adverse events. Individuals are encouraged to report negative side effects of vaccines to the US Food and Drug Administration (FDA) and the Centers for Disease Control and Prevention (CDC). Visit https://www.vaers.hhs.gov or call 1?800? 822?7967. In addition, side effects can be reported to Pfizer Inc. at www.pfizersafetyreporting.com or by calling 1-800-438-1985.

Click for
Fact Sheets and Prescribing Information for individuals 12 years of age and older
Full Prescribing Information (16 years of age and older) DILUTE BEFORE USE, purple cap
Full Prescribing Information (16 years of age and older) DO NOT DILUTE, gray cap
EUA Fact Sheet for Vaccination Providers (12 years of age and older), Purple Cap
EUA Fact Sheet for Vaccination Providers (12 years of age and older), Gray Cap
Recipients and Caregivers Fact Sheet (12 years of age and older)
Fact Sheets for individuals 5 through 11 years of age
EUA Fact Sheet for Vaccination Providers (5 through 11 years of age), Orange Cap
Recipients and Caregivers Fact Sheet (5 through 11 years of age)

**About Pfizer: Breakthroughs That Change Patients' Lives**
At Pfizer, we apply science and our global resources to bring therapies to people that extend and significantly improve their lives. We strive to set the standard for quality, safety and value in the discovery, development and manufacture of health care products, including innovative medicines and vaccines. Every day, Pfizer colleagues

work across developed and emerging markets to advance wellness, prevention, treatments and cures that challenge the most feared diseases of our time. Consistent with our responsibility as one of the world's premier innovative biopharmaceutical companies, we collaborate with health care providers, governments and local communities to support and expand access to reliable, affordable health care around the world. For more than 170 years, we have worked to make a difference for all who rely on us. We routinely post information that may be important to investors on our website at www.Pfizer.com. In addition, to learn more, please visit us on www.Pfizer.com and follow us on Twitter at @Pfizer and @Pfizer News, LinkedIn, YouTube and like us on Facebook at Facebook.com/Pfizer.

**Pfizer Disclosure Notice**
The information contained in this release is as of March 15, 2022. Pfizer assumes no obligation to update forward-looking statements contained in this release as the result of new information or future events or developments.

This release contains forward-looking information about Pfizer's efforts to combat COVID-19, the collaboration between BioNTech and Pfizer to develop a COVID-19 vaccine, the BNT162b2 mRNA vaccine program, and the Pfizer-BioNTech COVID-19 Vaccine, also known as COMIRNATY (COVID-19 Vaccine, mRNA) (BNT162b2) (including an application submitted to the FDA for EUA of a potential additional booster dose for older adults who have received an initial booster of any of the authorized or approved COVID-19 vaccines, qualitative assessments of available data, potential benefits, expectations for clinical trials, potential regulatory submissions, the anticipated timing of data readouts, regulatory submissions, regulatory approvals or authorizations and anticipated manufacturing, distribution and supply) involving substantial risks and uncertainties that could cause actual results to differ materially from those expressed or implied by such statements. Risks and uncertainties include, among other things, the uncertainties inherent in research and development, including the ability to meet anticipated clinical endpoints, commencement and/or completion dates for clinical trials, regulatory submission dates, regulatory approval dates and/or launch dates, as well as risks associated with preclinical and clinical data (including Phase 1/2/3 or Phase 4 data) for BNT162b2 or any other vaccine candidate in the BNT162 program in any of our studies in pediatrics, adolescents or adults or real world evidence, including the possibility of unfavorable new preclinical, clinical or safety data and further analyses of existing preclinical, clinical or safety data; the ability to produce comparable clinical or other results, including the rate of vaccine effectiveness and safety and tolerability profile observed to date, in additional analyses of the Phase 3 trial and additional studies, in real world data studies or in larger, more diverse populations following commercialization; the ability of BNT162b2 or any future vaccine to prevent COVID-19 caused by emerging virus variants; the risk that more widespread use of the vaccine will lead to new information about efficacy, safety, or other developments, including the risk of additional adverse reactions, some of which may be serious; the risk that preclinical and clinical trial data are subject to differing interpretations and assessments, including during the peer review/publication process, in the scientific community generally, and by regulatory authorities; whether and when additional data from the BNT162 mRNA vaccine program will be published in scientific journal publications and, if so, when and with what modifications and interpretations; whether regulatory authorities will be satisfied with the design of and results from these and any future preclinical and clinical studies; whether and when submissions to request emergency use or conditional marketing authorizations for BNT162b2 in additional populations, for a potential booster dose, for BNT162b2 or any potential future vaccines (including potential future annual boosters or re-vaccinations) and/or other biologics license and/or emergency use authorization applications or amendments to any such applications may be filed in particular jurisdictions for BNT162b2 or any other potential vaccines that may arise from the BNT162 program, including a potential variant based, higher dose, or bivalent vaccine, and if obtained, whether or when such emergency use authorizations or licenses will expire or terminate; whether and when any applications that may be pending or filed for BNT162b2 (including the submission to the FDA for EUA of a potential additional booster dose for older adults who have received an initial booster of any of the authorized or approved COVID-

19 vaccines and any requested amendments to the emergency use or conditional marketing authorizations) or other vaccines that may result from the BNT162 program may be approved by particular regulatory authorities, which will depend on myriad factors, including making a determination as to whether the vaccine's benefits outweigh its known risks and determination of the vaccine's efficacy and, if approved, whether it will be commercially successful; decisions by regulatory authorities impacting labeling or marketing, manufacturing processes, safety and/or other matters that could affect the availability or commercial potential of a vaccine, including development of products or therapies by other companies; disruptions in the relationships between us and our collaboration partners, clinical trial sites or third-party suppliers; the risk that demand for any products may be reduced or no longer exist; risks related to the availability of raw materials to manufacture a vaccine; challenges related to our vaccine's formulation, dosing schedule and attendant storage, distribution and administration requirements, including risks related to storage and handling after delivery by Pfizer; the risk that we may not be able to successfully develop other vaccine formulations, booster doses or potential future annual boosters or re-vaccinations or new variant based vaccines; the risk that we may not be able to maintain or scale up manufacturing capacity on a timely basis or maintain access to logistics or supply channels commensurate with global demand for our vaccine, which would negatively impact our ability to supply the estimated numbers of doses of our vaccine within the projected time periods as previously indicated; whether and when additional supply agreements will be reached; uncertainties regarding the ability to obtain recommendations from vaccine advisory or technical committees and other public health authorities and uncertainties regarding the commercial impact of any such recommendations; challenges related to public vaccine confidence or awareness; uncertainties regarding the impact of COVID-19 on Pfizer's business, operations and financial results; and competitive developments.

A further description of risks and uncertainties can be found in Pfizer's Annual Report on Form 10-K for the fiscal year ended December 31, 2021 and in its subsequent reports on Form 10-Q, including in the sections thereof captioned "Risk Factors" and "Forward-Looking Information and Factors That May Affect Future Results", as well as in its subsequent reports on Form 8-K, all of which are filed with the U.S. Securities and Exchange Commission and available at www.sec.gov and www.pfizer.com.

**About BioNTech**

Biopharmaceutical New Technologies is a next generation immunotherapy company pioneering novel therapies for cancer and other serious diseases. The Company exploits a wide array of computational discovery and therapeutic drug platforms for the rapid development of novel biopharmaceuticals. Its broad portfolio of oncology product candidates includes individualized and off-the-shelf mRNA-based therapies, innovative chimeric antigen receptor T cells, bi-specific checkpoint immuno-modulators, targeted cancer antibodies and small molecules. Based on its deep expertise in mRNA vaccine development and in-house manufacturing capabilities, BioNTech and its collaborators are developing multiple mRNA vaccine candidates for a range of infectious diseases alongside its diverse oncology pipeline. BioNTech has established a broad set of relationships with multiple global pharmaceutical collaborators, including Genmab, Sanofi, Bayer Animal Health, Genentech, a member of the Roche Group, Regeneron, Genevant, Fosun Pharma, and Pfizer. For more information, please visit www.BioNTech.de.

**BioNTech Forward-looking Statements**

This press release contains "forward-looking statements" of BioNTech within the meaning of the Private Securities Litigation Reform Act of 1995. These forward-looking statements may include, but may not be limited to, statements concerning: BioNTech's efforts to combat COVID-19; the collaboration between BioNTech and Pfizer including the program to develop a COVID-19 vaccine and COMIRNATY (COVID-19 vaccine, mRNA) (BNT162b2) (including an application submitted to the FDA for an EUA of a potential additional booster (fourth) dose for individuals 65 years of age and older and any requested amendments to the emergency use or conditional marketing authorizations,, qualitative assessments of available data, potential

benefits, expectations for clinical trials, the anticipated timing of regulatory submissions, regulatory approvals or authorizations and anticipated manufacturing, distribution and supply); our expectations regarding the potential characteristics of BNT162b2 in our clinical trials, real world data studies, and/or in commercial use based on data observations to date; the ability of BNT162b2 or a future vaccine to prevent COVID-19 caused by emerging virus variants; the expected time point for additional readouts on efficacy data of BNT162b2 in our clinical trials; the nature of the clinical data, which is subject to ongoing peer review, regulatory review and market interpretation; the timing for submission of data for BNT162, or any future vaccine, in additional populations, or receipt of, any marketing approval or emergency use authorization or equivalent, including or amendments or variations to such authorizations; the development of other vaccine formulations, booster doses or potential future annual boosters or re-vaccinations or new variant based vaccines; our contemplated shipping and storage plan, including our estimated product shelf life at various temperatures; the ability of BioNTech to supply the quantities of BNT162 to support clinical development and market demand, including our production estimates for 2022; challenges related to public vaccine confidence or awareness; decisions by regulatory authorities impacting labeling or marketing, manufacturing processes, safety and/or other matters that could affect the availability or commercial potential of a vaccine, including development of products or therapies by other companies; disruptions in the relationships between us and our collaboration partners, clinical trial sites or third-party suppliers; the risk that demand for any products may be reduced or no longer exist; the availability of raw material to manufacture BNT162 or other vaccine formulation; challenges related to our vaccine's formulation, dosing schedule and attendant storage, distribution and administration requirements, including risks related to storage and handling after delivery; and uncertainties regarding the impact of COVID-19 on BioNTech's trials, business and general operations. Any forward-looking statements in this press release are based on BioNTech current expectations and beliefs of future events and are subject to a number of risks and uncertainties that could cause actual results to differ materially and adversely from those set forth in or implied by such forward-looking statements. These risks and uncertainties include, but are not limited to: the ability to meet the pre-defined endpoints in clinical trials; competition to create a vaccine for COVID-19; the ability to produce comparable clinical or other results, including our stated rate of vaccine effectiveness and safety and tolerability profile observed to date, in the remainder of the trial or in larger, more diverse populations upon commercialization; the ability to effectively scale our productions capabilities; and other potential difficulties.

For a discussion of these and other risks and uncertainties, see BioNTech's Annual Report as Form 20-F for the Year Ended December 31, 2020, filed with the SEC on March 30, 2021, which is available on the SEC's website at www.sec.gov. All information in this press release is as of the date of the release, and BioNTech undertakes no duty to update this information unless required by law.

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7 Bar-On YM, Goldberg Y, Mandel M, et al. Protection by 4th dose of BNT162b2 against Omicron in Israel. medRxiv. 2022:2022.02.01.22270232. doi:10.1101/2022.02.01.22270232

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