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Borne Diseases

Are All Inhaled Drugs Climate Friendly?

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It is broadly known that human activity has a direct and/or indirect in uence on the Environment and ultimately the Global Climate. Several industrial activities such as the manufacturing of refrigerants, aerosols, re suppression agents or solvents, are being restructured in order to nd the best "climate friendly" replacement for the most commonly and generically used agents. Inhaled drugs, on the other hand, still require greater commitment to develop more environmentally-compatible medications. is should be a priority.

However, the issue is, what are the environmental impacts that we expect from an inhaled drug? A response is not easy; however, some light may be shed when we consider the three main environmental hazards: the ozone layer depletion, the photochemical smog and the global warming.

e role of Cl and Br atoms in ozone layer depletion was discov-
e12(t)-5(ies)-745C(t)-6(a)12(34)-6(a)1[1].ae ataf aew aon ahorine-containing aeplace-
ment species may be the feature to control and minimize this impact.
e Montreal Protocol and its continuous updates on Substances that
Deplete the Ozone L5(a)18(y)8(er)-33(wa)3(s)-33(es)5(t)-6(a)8(b)7(li)3(s)4(h)4(e)-5(d)-33(t)6(o)-33(p)7(h)3(a)3(s)-8(e-o)11(u)12(t)-33(t)-6(h)4(e)-3
lig-4t tieD4(fiD(f))-61ons. is shFshe s (ces)-65(t)-6(h)3()5(t)-253(inimize)-615(l)-65(P4¶f(le m)1.2 (a)12(355h)3(a)3(s5(g)-7(lo)5(b)-253(s)5(d)-95(
a234o cr(s)-683(812(eas)81-9(p)-5¶51.57e-3(s)81at(t)]-6)ea

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134a (CH_2FCF_3) and HFA-227ea (CF_3CHFCF_3), are 1430 and 3220, respectively, whereas the GWP for the CFC that replace, CFC-11 (CCl_3F), is just a little bit lower (4750) [5]. erefore, the propellants that are being used are not completely environmentally- benign.

e inhaled anesthetic overview is similar to the asthma propellants. Only in 2006 in the United States, general anesthetics were administered to at least 50 million patients. Besides, anesthetic gases are widely used in dentist o ces, veterinary clinics and research laboratories. N_2O is the most popular anesthetic gas, and according to some estimates, the emissions of N_2O during 2006 were approximately $3.5x10^4$ tons used for anesthetic purposes for 70 million patients, that is 3% of total N_2O emissions in the United States during 2006 [11]. It is worth noting that N_2O contributes to both global warming (GWP_{100} = 298) and ozone layer depletion [5,12]. Aside from N_2O, all volatile anesthetic currently used are halogenated gases. E orts were carried out to replace anesthetic containing Cl and/or Br atoms with some novel ones − mainly hydro uoroethers (HFE) − that do not contribute to the ozone layer. For example, des urane ($CHF_2OCHFCF_3$) and sero urane ($(CF_3)_2CHOCH_2F$) are currently two of the most common volatile anesthetic agents, and have replaced others such as iso urane ($CF_3CHClOCHCF_2$), halothane ($CF_3CHClBr$) or en urane (CHF_2O-CF_2CHFCl) [4]. Nevertheless, as happened with the HFA propellants, they all have again relatively large GWPs – for instance des urane and sevo urane show GWP_{100} values of 1620 and 210, respectively [13]. is suggests that both HFAs and HFEs are useful alternatives to combat the ozone layer depletion but still contribute to the global warming issue.

In conclusion, some inhaled drugs contribute to the global warming and ozone depletion. Nowadays, it is possible to predict by com-
pdict a(t)-OL6 BDC 5.247 0 0(wa)9(r)13r t24717(t2454t)6(e)-47(t)6(o)-47(t)-6dr f .C 5.247177(dr)-1-47(wa)9(oo)-d6(o)-9177(-47(wa)9(r)-647(t)AOB
(p)12onhe2up3 condesy opir mhe 11(u7(t)-6(e)-99(42p)7(let)-5(io43(m)-6(h)4rt)-kh)418(ys, (e)-(p3).(io43(S4714)-47(dr)-10(ug(N)25()3(s]T10.28(