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## Influence of conflicts of interest on public positions in the COVID-19 era, the case of Gilead Sciences

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TITLE PAGE

**Full-length title: Influence of conflicts of interest on public positions in the COVID-19 era, the case of Gilead Sciences**

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1 **Abstract**

2 Fundings and gifts from the pharmaceutical industry have an influence on the decisions made by  
3 physicians and medical experts. In the context of the COVID-19 epidemic, several treatments are  
4 available to treat patients infected with the virus. Some are protected by patents, such as remdesivir,  
5 others are not, such as hydroxychloroquine. We wanted to observe the possible correlation between  
6 the fact, for an academic doctor in infectious diseases, of having benefited from funding by Gilead  
7 Sciences, producer of remdesivir, and the public positions taken by this doctor towards  
8 hydroxychloroquine. Our results show a correlation (correlation coefficient = 1) between the amount  
9 received from the Gilead Sciences company and public opposition to the use of hydroxychloroquine in  
10 France. This should open up the debate on the role of the interest links of doctors with pharmaceutical  
11 companies in the medical and scientific public debate.

## 12 **Introduction**

13 The influence of private interests on scientific research is a well studied research object (Lexchin  
14 1993) (Dana, 2003) (Blumenthal, 2004). If the payment of substantial sums is recognized as a source  
15 of conflicts of interest, small gifts or meals offered are more tolerated. However, it has been shown  
16 that they influence the behavior of those who receive them (Katz, 2003). “There’s no such thing as a  
17 free lunch” claimed Nobel Prized Milton Friedman (Friedman, 1975). For example, it has been shown  
18 that intense contact with pharmaceutical companies is significantly associated with the prescription of  
19 recent drugs (Watkins, 2003), or more expensive drugs when an alternative exists (Sharma, 2018). The  
20 low value of these gifts does not take away from their influence: doctors who are offered meals by the  
21 pharmaceutical industry prescribe more promoted drugs (Dejong, 2016). The influence of these gifts is  
22 not well perceived by doctors, who consider it less influential than what their patients estimate  
23 (Gibbons, 1998). Doctors are aware that gifts from industry can influence their colleagues, but few  
24 recognize that they can influence them themselves (Steinman, 2001).

25 In France, since Law No. 2011-2012 of December 29, 2011 (1), companies producing or marketing  
26 pharmaceutical products are required to make public all the agreements they conclude, in particular  
27 with healthcare professionals, as well as the benefits (including meals and the costs paid for attending  
28 conferences) and the remuneration they grant them. It is the laboratories which are obliged to declare  
29 these payments which show a link of interest. A public site whose consultation is open to the public  
30 lists all these declarations: [transparence-sante.gouv.fr](http://transparence-sante.gouv.fr). Since the start of the Coronavirus epidemics,  
31 the public authorities had to push or limit the use of candidate treatments for COVID-19. These  
32 decisions have become the subject of public debates, in the written, digital, television and radio press.  
33 To inform the debates, infectious disease physicians were asked by the media to give their point of  
34 view on the use of the different treatments.

35 Candidate treatments for COVID-19 can be divided into two categories: those that are protected by a  
36 patent held by a pharmaceutical company, such as Remdesivir, Kaletra - before Abbvie abandoned its  
37 rights to the drug following negative studies on COVID19 (Cao, 2020). Others are generic:

38 hydroxychloroquine, azithromycin. 39 companies are currently manufacturing hydroxychloroquine  
39 (Million, 2020) The choice of the drug by the public authorities therefore translates into a significant  
40 gain or loss for the various laboratories which hold the rights to a candidate molecule.

41 The conflict between hydroxychloroquine and remdesivir, started by a publication listing both as  
42 treatment candidates (Wang, 2020), has grown considerably, with announcements and counter-  
43 announcements as well as contradictory articles (Gautret, 2020) (Gautret, 2020) (Chen, 2020) (Chen,  
44 2020) (Huang , 2020) (Tang, 2020) (Mahevas, 2020) (Magagnoli, 2020), which had a significant  
45 influence on the share price of the company Gilead Sciences, listed on the NASDAQ (See for example  
46 the statement by Anthony Fauci (2) from April 29, 2020, synchronized with an article published in the  
47 Lancet at the same time (Wang, 2020)). It therefore seems relevant to us to focus on the links of  
48 interest between Gilead Sciences and various opinion leaders, infectious disease physicians in France  
49 that are now stakeholders of this health crisis.

50 This debate led us to wonder about the role of pharmaceutical companies in the current therapeutic  
51 debate. We particularly question the laboratories that hold rights to a candidate molecule, in particular  
52 Gilead Sciences with Remdesivir. Are the medical researchers who have spoken in recent weeks in the  
53 debate on the use of hydroxychloroquine in a position of a conflict of interest? This is the question we  
54 wanted to answer by studying the links of interest between Gilead Sciences, producer of Remdesivir,  
55 and the doctors who took a stand for or against hydroxychloroquine.

56

## 57 **Materiel and methods**

58 To establish the list of French academic infectious disease physicians, we used the list of members of  
59 CMIT (Council of Teachers in Infectious and Tropical Diseases). In the list we obtained, 98 medical  
60 researchers were identified. Public interventions were defined as a direct expression of opinion in a  
61 media, academic or not academic. Non-academic newspapers included national newspapers, regional  
62 newspapers, television channels, radio channels. For each member of the CMIT, we did a systematic  
63 search on Google News to identify press reports containing the word Hydroxychloroquine and quoting

64 this member of the CMIT. We carefully read their interventions and classified their positioning on a  
65 scale of 1 to 5, 1 meaning that they were very unfavorable to the use of hydroxychloroquine, 5 that  
66 they were very favorable to it. “Very favorable” was defined as “having expressed a call for  
67 generalization of the use of hydroxychloroquine, or reporting a successful use of the treatment in the  
68 physician’s facility”. “Favorable” was defined as “having recognized a positive effect of  
69 hydroxychloroquine, while waiting for confirmation of results for taking further position”. “Neutral”  
70 was defined as “expressing the need for more studies for making any comment of the efficiency of the  
71 treatment”. “Unfavorable” was defined as “while still waiting for more results, expressing negative  
72 comments about hydroxychloroquine”. “Very unfavourable” was defined as “expression of anger  
73 towards the mediatization of hydroxychloroquine, or a strict opposition towards the generalization of  
74 the use of hydroxychloroquine”.

75 Using the eurofordocs.fr website which aggregates the data from the transparence-sante.gouv.fr  
76 website, we listed the links of interest with the Gilead Sciences laboratory of all CMIT members, as  
77 well as their links of interest with all companies subject to the declaration on the Transparency Health  
78 platform. We finally established the average of the sums received from Gilead Sciences for each of the  
79 categories of researchers established by their positioning with respect to hydroxychloroquine;  
80 similarly, we have averaged the amounts received by all reporting companies. We performed a  
81 Spearman correlation test to explore the relation between position towards hydroxychloroquine and  
82 funding received by Gilead Sciences.

83

## 84 **Results**

85 A total of € 678,527 was paid by the company Gilead Sciences, manufacturer of Remdesivir in 7  
86 years, to doctors who are members of CMIT (Table 1). This represents an average of € 6,924 per  
87 doctor. All reporting companies combined, a total of € 4,603,098 was paid to CMIT physicians  
88 between 2013 and 2019 (Table 2). There is a strict correlation (Spearman test,  $p=0,017$ ) between the  
89 position of doctors towards hydroxychloroquine and the average amount paid to them by the company

90 Gilead Sciences between 2013 and 2019. In all, only 13 doctors out of 98 CMIT members did not  
91 receive any benefit, remuneration or agreement from the Gilead Sciences company between 2013 and  
92 2019. Among these 13 doctors, 7 were very favorable to the use of hydroxychloroquine, 1 favorable, 1  
93 neutral and 4 have not taken a position. On the opposite, among the 13 doctors that received the most  
94 important funding from Gilead Sciences, 6 were very unfavorable to the use of hydroxychloroquine, 1  
95 unfavorable, 3 neutral and 3 have not taken a position.

96

## 97 **Discussion**

98 In this short work, we wanted to observe the influence of conflicts of interest, in the time of COVID  
99 was confirmed. Not surprisingly, we have shown a correlation but we have been impressed by the  
100 level of correlation, which is perhaps one of the explanations for the violence of the debate that has  
101 taken place concerning the use of hydroxychloroquine. None of the studies involving Remdesivir  
102 (Wang, 2020) or Lopinavir/Ritonavir (Cao, 2020) could show any effectiveness of these drugs in the  
103 could show effectiveness in the prevention of mortality or the reduction, and reduction of the the viral  
104 load of COVID-19, whereas 4 studies have now shown significant differences on: clinical course,  
105 radiological course, mortality, viral load (Million, 2020) (Yu, 2020) (Huang, 2020) (Membrillo de  
106 Novales, 2020). In addition, the issue of conflict of interest goes beyond that of practitioners, and also  
107 undoubtedly affects publishers and conference organizers, who also have links of interest with the  
108 most dynamic pharmaceutical manufacturers. The COVID crisis will make it possible to re-analyze  
109 many things, including the issue of conflicts of interest, a problem which is absolutely not resolved in  
110 many countries of the world, including France. It does not concern only doctors, this matter also  
111 concerns publishers and organizers of medical events, who are subject to the same types of financial  
112 conflicts. It is interesting to notice that major measures have been taken in France to fight conflicts of  
113 interest in politics, including mandatory declarations of patrimony during the course of the mandates  
114 of representatives to a national authority (HATVP), such measures have not been taken in the medical  
115 field.

116

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232 **Table 1: Links of interest with Gilead Sciences between 2013 and 2019 depending on the position**  
 233 **towards hydroxychloroquine (HCQ)**

Position towards HCQ	Number	Average (€)	Median (€)	Extreme – (€)	Extreme + (€)
Very favorable	8	52	0	0	417
Favorable	6	1524	1208	0	4773
Neutral	14	9729	2729	0	48006
Unfavorable	7	11085	10547	234	31731
Very Unfavorable	9	24048	26950	122	52812
Did not take position	54	4421	2143	0	36706
<b>TOTAL</b>	<b>98</b>	<b>6924</b>	<b>2188</b>	<b>0</b>	<b>52812</b>

234 **Table 2: Links of interest with pharmaceutical companies between 2013 and 2019 depending on**  
 235 **the position towards hydroxychloroquine (HCQ)**

Position towards HCQ	Number	Average (€)	Median (€)	Extreme – (€)	Extreme + (€)
Very favorable	8	6649	1558	42	30875
Favorable	6	10913	9999	42	24840
Neutral	14	62858	26339	585	291755
Unfavorable	7	61519	57529	11842	100358
Very Unfavorable	9	157939	130250	7498	543673
Did not take position	54	32451	19766	0	241267
<b>TOTAL</b>	<b>98</b>	<b>46970</b>	<b>21978</b>	<b>0</b>	<b>543673</b>

236