OBJECTIVES
The objective of this study was to investigate longitudinal trends in air quality and home-recorded spirometry in pulmonary fibrosis patients in the Dallas-Fort Worth area.

METHODS
Study participants were recruited via the PF Warriors patient support group based in Dallas-Fort Worth, Texas, USA. Participants were provided with the patientMpower mobile application for IPF and a portable Bluetooth spirometer (Spirobank Smart, MIR Inc., Italy). Participants were free to use the patientMpower app and MIR spirometer as often as they wished.

RESULTS
Between July 2017 and October 2018, 17 people living with IPF in the Dallas-Fort Worth area used the patientMpower app and Spirobank Smart spirometer. Table 1 details the characteristics of the participants.

Table 1: Cohort Characteristics (N=17)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age, y</td>
<td>64.3 ± 8.4</td>
</tr>
<tr>
<td>Ethnicity</td>
<td>white 15 (88%)</td>
</tr>
<tr>
<td>Sex</td>
<td>male 13 (76%)</td>
</tr>
<tr>
<td>Height, cm</td>
<td>174.3 ± 7.4</td>
</tr>
<tr>
<td>Weight, kg</td>
<td>85.0 ± 15.5</td>
</tr>
<tr>
<td>FVC % predicted</td>
<td>59.3 ± 26.9</td>
</tr>
<tr>
<td>FVC absolute, L</td>
<td>2.46 ± 1.12</td>
</tr>
</tbody>
</table>

Data are presented as mean ± SD or No. (%). FVC absolute values are from available home spirometry.

The 17 participants recorded 837 home spirometry readings (average: 49; median: 13; range: 1-418).

Figure 1 shows the percentage of predicted Forced Vital Capacity (FVC) and the O₃ category level for the 17 participants, while Figure 2 shows the percentage of predicted FVC versus PM₂.₅.

It was observed that this group of IPF patients were exposed to higher levels of O₃ in the summer months compared to winter months.

80% of patients used the patientMpower app and Spirobank Smart spirometer on days with unhealthy levels of O₃.

CONCLUSIONS
This study demonstrated the feasibility of employing the patientMpower app and Spirobank Smart spirometer as a tool to longitudinally monitor IPF patients’ real-world lung function measurements, in addition to corresponding air quality information.

IPF patients in the Dallas-Fort Worth area are frequently exposed to moderate or unhealthy levels of air pollution. This tool may be of clinical value in analyzing the impact of air quality on FVC and lung health in a specific geographic region such as the Dallas-Fort Worth area.

More research is needed to evaluate the sensitivity of the system in predicting lung function decline and exacerbations in IPF patients.

REFERENCES

We would like to thank all of the PF Warriors who took part in this study.

Commercial support & relevant financial interests:
Study funded by patientMpower Ltd. M. Holmes, C. Edwards & E. Costello are employees and shareholders of patientMpower Ltd. B. Vick is an advisor to patientMpower Ltd. (reimbursed).

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