I am doing my Research work (Ph.D) in the Department of Industrial Engineering, Anna University, Guindy, Chennai. My Research topic is ‘A STUDY OF LOWER BACK DISORDERS AMONG INDIAN VEHICLE DRIVERS AND ANALYSIS OF POTENTIAL ENVIRONMENTAL ERGONOMIC RISK FACTORS’. As a part of my research work, I am collecting data from the Drivers and Office staff members through questionnaire. You are requested to kindly provide the information by choosing the answer from among the alternatives given in the questionnaire. It is assured that the information provided by you will be kept confidential and used for the academic purpose only.

LOWER BACK DISORDERS
HEALTH SURVEILLANCE QUESTIONNAIRE

DATE OF INQUIRY:
SECTION A: Personal and General Information

Name: ……………………… Mobile. No: ………………………………
Address: ………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………………
………………………………………………………………………………
Post code: ………………………
Date of birth: ……………………… Sex:
……………………
Height: ………. ft/m. ………. in/cm Weight: ……………………………
Marital status: ……………………………
(Single/married/divorced/separated/widowed)
Educational Qualification: ……………………………………………………………
Income/month: ………………………………………………………………………
1. Do you exercise regularly? Yes [ ] No[ ]
2. How often each week does you engage in any vigorous exercise program or work-out?
   a) Never [ ] b) 1 to 2 times [ ] c) 3 times or more [ ] d) Everyday [ ]
3. Do you smoke?  
   Yes [ ]  
   No [ ]

   When did you start smoking regularly?
   Do you still smoke?  
   Yes [ ]  
   No [ ]

   If no, when did you give up smoking regularly?  ...........

   If yes, how much did you or do you smoke?  ..................

4. Do you chew pan/tobacco?  
   Yes [ ]  
   No [ ]

   When did you start chewing pan/tobacco regularly?  ...........

   Do you still chew pan/tobacco?  
   Yes [ ]  
   No [ ]

   If no, when did you give up chewing pan/tobacco regularly? ...........

   If yes, how much did you or do you chew pan/tobacco?  ..................

5. Do you drink alcoholic beverages?  
   Yes [ ]  
   No [ ]

**SECTION B: Occupational History**

**Previous job(s)**

1. What was/where your previous occupation(s)?
   .................................................................................. for .............. years.
   .................................................................................. for .............. years.
   .................................................................................. for .............. years.

2. Did you drive in your previous jobs on vehicle like: trucks, buses, fork lifts, earth moving equipment etc.? Yes ............. No .............

   If yes, vehicle
   ..............year(s) on an ................. on an average ...............hours/day
   ..............year(s) on an ................. on an average ...............hours/day
   ..............year(s) on an ................. on an average ...............hours/day
   ..............year(s) on an ................. on an average ...............hours/day

3. Did your previous job(s) involve:
   Prolonged sitting?  
   Yes [ ]  
   No [ ]

   Heavy physical demands?  
   Yes [ ]  
   No [ ]

4. Did you ever have low back pain in your previous job(s)? Yes [ ]  No [ ]

5. Did or do you drive on a regular basis any kind of vehicle in your spare time (outside work)? Yes [ ]  No [ ]

   If yes,
   Type of vehicle  
   from-until  
   hours/day  
   days/week  
   weeks/year

   ..................  ..................  ..................  ..................  ..................
Present job (if any)

1. Do you drive any kind of vehicle in your present job? (i.e. car, bus, van, truck, train, tram helicopter, other)  Yes [ ] No [ ]
   If yes
   Type of vehicle from-until hours/day days/week weeks/year
   …………………………………… ………….. …………. …………. ………….. ………….. …………..
   …………………………………… ………….. …………. …………. ………….. ………….. …………..
   …………………………………… ………….. …………. …………. ………….. ………….. …………..
   If No, What is your current occupation? …………………………………………….

SECTION C: Intensity of Whole body Vibration

1. How much vibration do you feel during the driving?
   a) Very Mild   b) Mild   c) Moderate   d) Strong   e) Very Strong
2. Do you experience vehicle jerking during driving?
   a) Never   b) Seldom   c) Sometimes   d) Often   e) Always
3. Do you experience vehicle jolting during driving?
   a) Never   b) Seldom   c) Sometimes   d) Often   e) Always

SECTION D: Posture

1. Which postures do you adopt when driving?
   Torso against backrest ……… ………….. ………….. ………….. ………….. ………….. …………..
   Torso straight ……… ………….. ………….. ………….. ………….. ………….. …………..
   Torso bent ……… ………….. ………….. ………….. ………….. ………….. …………..
   Torso twisted ……… ………….. ………….. ………….. ………….. ………….. …………..
   Torso bent & twisted ……… ………….. ………….. ………….. ………….. ………….. …………..

SECTION E: Work Environment

Road Condition:
**Seat Condition:**

1. How often does your seat bottom out while you are driving?
   a) Never [ ]  b) Seldom [ ]  c) Occasionally [ ] d) Often [ ]  e) Always [ ]

2. What is your opinion of the seat comfort?
   a) Excellent [ ]  b) Good [ ]  c) Acceptable [ ] d) Unsatisfactory[ ] e) Most unsatisfactory [ ]

3. What type of Suspension present in your seat?
   a) Mechanical suspension  Yes [ ]  No [ ]
   b) Air Suspension  Yes [ ]  No [ ]
   c) No Suspension  Yes [ ]  No [ ]

4. Does the locomotive seat you have been using
   Yes [ ] No [ ]
   Arm rest ........... ...........
   Adjustable lower back support ........... ...........

**Discomfort:**

Do you experience discomfort by mechanical vibration or shock in your work?

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**SECTION F: Duration**

**Drive Duration:**

1. How much time do you travel every day? .................
   a) <3 hours [ ]  b) 3-5 hours [ ]  c) 5-7 hours [ ]  d) 7-9 hours [ ]  e) >9 hours [ ]

2. How much time do you drive every day?
   a) <2 hours [ ]  b) 2-4 hours [ ]  c) 4-6 hours [ ]  d) 6-8 hours [ ]  e) >8 hours [ ]

3. How much time did the vibration bothers you during your work day?
   a) < 1 hour [ ]  b) 1-3 hours [ ]  c) 3-5 hours [ ]  d) 5-7 hours [ ]  e) >7 hours [ ]
4. What is the duration of stationary time or crawling during driving?
   a) < ½ hours [ ]  b) ½ - 1 hour[ ]  c) 1-2 hours [ ]  d) 3-4 hours [ ] d) > 4 hours [ ]

**Break Duration:**

1. Duration of break do you usually take during the work day (getting out of your vehicle)?
   a) >2 hour [ ]  b) 1 ½ - 2 hours [ ]  c) 1 - 1 ½ hours [ ]  d) 1/2 – 1 hours [ ]
   e) < 1/2 hour [ ]

2. What do you do during your breaks?
   a) Lay down [ ]  b) Walk around [ ]  c) Stand [ ]  d) Sit [ ]  e) Others [ ]

**SECTION G: Psychosocial Factors**

**Psychosocial Work Aspect:**

1. In Your job, do you have a choice in deciding:
   i. How you do work?
      a) Always [ ]  b) Often [ ]  c) Occasionally [ ]  d) Seldom [ ]  e) Never [ ]
   ii. What you do at Work?
      a) Always [ ]  b) Often [ ]  c) Occasionally [ ]  d) Seldom [ ]  e) Never [ ]
   iii. Your work timetable and breaks?
      a) Always [ ]  b) Often [ ]  c) Occasionally [ ]  d) Seldom [ ]  e) Never [ ]

**Psychosocial Personal Aspect:**

1. When you have difficulties in your work, how often do you get help and support from your colleagues?
   a) Always [ ]  b) Often [ ]  c) Occasionally [ ]  d) Seldom [ ]  e) Never [ ]

2. When you have difficulties in your work, how often do you get help and support from your supervisor?
   a) Always [ ]  b) Often [ ]  c) Occasionally [ ]  d) Seldom [ ]  e) Never [ ]

3. How satisfied have you been with your job as a whole, taking everything into consideration?
   a) Very Much Satisfied[ ]  b) Highly Satisfied [ ]  c) Satisfied [ ]  d) Not Satisfied [ ]
   e) Sad [ ]
SECTION H: Health information of Lower Back Disorder

In this section, you will be asked about trouble you might have had in different parts of the body and at different time periods. **If you never have had any back pain/problem, ignore this section.**

**LBD Prevalence level:**

1. Have you ever had low back trouble (ache, pain or discomfort)? Yes ……. No……..

2. What is the total length of time that you have had low back trouble during the last 7 days?
   a) < 8 hours [ ]   b) 8- 24 hrs [ ]   c) 1 - 3 days [ ]   d) 3 - 5 days [ ]   e) Everyday [ ]

3. What is the total length of time that you have had low back trouble during the last 12 months?
   a) 1 – 3 weeks [ ]   b) 1 - 3 months [ ]   c) 3 – 6 months [ ]   d) 6-9 months [ ]
   e) Always [ ]

4. The extent of trouble you had during last 7 days in Lower Back?
   a) Very Less [ ]   b) Less [ ]   c) Moderate [ ]   d) High [ ]  e) Severe [ ]

5. The extent of trouble you had during last 12 months in Lower Back?
   a) Very Less [ ]   b) Less [ ]   c) Moderate[ ]   d) High [ ]  e) Severe [ ]

**Prevention of Activities:**

1. During last 7 days have you been prevented from carrying out normal activities (job, house work, hobbies) because of trouble in Lower Back?
   a) Not at all [ ]   b)To a small extent [ ]   c) To Some extent [ ]
   d) To a large extent [ ]  e) To a very large extent. [ ]

2. During last 12 months have you been prevented from carrying out normal activities (job, house work, hobbies) because of trouble in Lower Back?
   a) Not at all [ ]   b)To a small extent [ ]   c) To Some extent [ ]
   d) To a large extent [ ]  e) To a very large extent. [ ]

3. Have you ever had to change jobs or duties because of low back trouble?
   a) Yes [ ]   b) No [ ]
Medical Intervention:

1. Have you been seen by a doctor, physiotherapist, chiropractor or other such person because of low back trouble during the last 12 months?
   a) Never [ ]  b) Seldom [ ]  c) Sometimes [ ]  d) Often [ ]  e) Always (Bed rest)[ ]

2. What treatment did your doctor prescribe? ........................................
   a) Drugs [ ]  b) Ointments [ ]  c) Physical therapy  d) Surgery  e) Others

3. Have you been hospitalized because of low back trouble?
   a) Yes [ ]  b) No [ ]

4. Have you ever had a trauma to your back that required a medical visit?
   a) Yes [ ]  b) No [ ]

Thank you very much for your help – You have now completed the confidential questionnaire
## Appendix 2

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ΕΣυ 2: Εο Ήελον Αύγουστο

• Εους - Εο (ΠΟ)

1. u0p0 « E o Ω Α - ΁ω Αμυσ • B, • Ωπ0 » zvAGBÜ E o Ω Α C, εωΠ0?

2. u0 [Π0, E [Π1B • Εους - Εο Π1A
   (A) s h = |μ0 Εεξ ΕΤ Οο ~ ΟΟ Ο0C, U QoP1 o Ω Π0? B® [ ] CΑο» [ ]
   (B) ΕDΑoÜ_ο0ΠoIα = Εη Σ C, U QoP1 o Ω Π0? B® [ ] CΑο» [ ]

3. E [Π1B • Εους - Εο Π1B = ExRl • xS u i Α Χυ Α Χ Α ¼ E η ΕοC, U QoP1 o Ω Π0?
   B® [ ] CΑο» [ ]

4. E [Π1B • Εους - Εο Π1A - ΑΟρ] = ΕΕυo Ω Ν 00 - Ω [Π1A - ΑΟ Η - Υ]
   ΑρPζου Υ Ω U Σ Υ Ε Φ Α Ε Α ε Η ο Ώ Πο?

B® GUA

5. E [Π1B u0 - Έους - Ε o Ω Α - Ωνπό Ι C - USQOΠ1 o Ω Π0? B® ] CΑο»[ ]

6. E [Π0 u0 - Έους - Ε o Ω Α δ Ε Α ρ P Ζ ο u Ω C - USQ0Π0? .................
ESV 3: C⁻ φυμ ΑνοΑΒ υμβο

1. [ΠΟ, ΆδΠÙ [Πο [C⁻ USΌ + τον] ΑπωόΡ⁻ ΑνοΑΟΩ] Ε ν ηοχΟιοΠΟ? A) ἀΡ⁻, χΑοΑ ΑνοΑ [ ] B) ἀ, χΑοΑ ΑνοΑ [ ] C) ἀΜοΑ ΑνοΑ [ ] D) ΑνΡοΩ ΑνοΑ [ ] E) ἀΡ ΑνΡοΩ ΑνοΑ [ ]

2. [ΠΟ ΆδΠÙ [Πο [C⁻ USΌ + τον] ηοό Ε ν ηοΑ (Jerkıng) Ε ν ηοχΟιοΠΙό? A) ΚΑο [ ] B) Α-υοΡ [ ] C) ]` ΠΑ [ ] D) Ε ] ` • οΩ [ ] E) ΠοοΔΕυΜ [ ]

3. [ΠΟ ΆδΠÙ [Πο [C⁻ USΌ + το] ΣκοοΤοÙ Σ½ [Σ ΑνοΑΠοο (Jolting) Ε ν ηοχΟιοΠΙό?] A) ΚΑο [ ] B) Α-υοΡ [ ] C) ]` ΠΑ [ ] D) Ε ] ` • οΩ [ ] E) ΠοοΔΕυΜ [ ]

ESV 4: +υοΩο

1. [ΠΟ ΆδΠÙζου C⁻ USΌ Ειμί ζνΑ ΓΕΑοΡοΩ ΕάΒ ΑΡ μοο +υοΩζου Ποή ηο ιο ΠΟ?

ESV 5: Ε ο \νορν _οΩο `ÇΑ

\#ο {ο ο}:

8. [ΠΟ ΑΚΩΠοο Ε η ο ο`2 οουφαλοο ΓΕΑοΩ ΕΟΙξ έ? A) ἀΡ⁻ οοκοÙ ήσου [ ] B) οοκοÙ ήσου [ ] C) οοκοÙ ήσου [ ] D) οοκοÙ ήσου [ ] E) ΠΑ⁻, οοκοÙ ήσου [ ]
2. [PO AçµP®ΩP E° µ®ò® 2® £ò®u:
A) [Pµ ðò®] [ ]
B) ô©ò®µâ ðò®» [ ]
C) ô÷5ò®| ðò®» [ ]
D) ©®° ðò® k ë®k ðò®» [ ]
E) ô°° ðò® k ë®k ðò®» [ ]

3. [PO AçµPúžou C° US° +£ò®x, AçµPúžvß +ÂP® GÆÁ›ó C° US°?
A) õ®à®µª ðò® ð°® Kµ®h° [ ]
B) ñ®ì® ðò® ð°® Kµ®h° [ ]
C) ù®ð®ì® ðò® ð°® Kµ®h° [ ]
D) +ÂP®ì® ðò® ð°® Kµ®h° [ ]
E) õ® P +ÂP®ì® ðò® ð°® Kµ®h° [ ]

C, Ù®P°ô {ø}

1 [PO AçµPúžou C° US° +£ò®x C°, Ù®P° ñ® B À©® Aë®À©®° ðò®?
A) G° ôë®E à®ºò° • [ ]
B) A°ì® ðò® [ ]
C) G° ôë®ì® ÈñoÁx [ ]
D) £°° øò® [ ]
E) G° ôë®Èx® [ ]

2 u[PÍß C°, Ù®P° ñ® ðò® À®° ð°® ð°® È[ PÍß A° “ñ®ì®°
A) ô®à®] ô®ì® C°, Ù®P° [ ]
B) ô®ì® C°, Ù®P° [ ]
C) H°ì® ò®P®ì® ñ® T°ì® C°, Ù®P° [ ]
D) À®ì® ðò® À®° ñ® C°, Ù®P° [ ]
E) ô® PÂ® À® ðò® À®° ñ® C°, Ù®P° [ ]

3 E[PÍß C°, Ù®P° À® GÆÁ›ó ðò® ñ® õ® À®° ñ® C°h°]UQ (Suspension)
ðò®°, zu°ì® Ëì®ì®ì® ñ®x?
1. C° “ñ®ì® C°h°]UQ (Mechanical Suspension) [ ]
2. ò®P®ì® C°h°]UQ (Air Suspension) [ ]
3. C°h°]UQ CÀ®° (No Suspension) [ ]

4 E[PÍß C°, Ù®P° À®

B°
CÀ®°

õ®ì® [Q (çò® ò® ðò®° Èì®ì®ì® [ ]
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õ® P®ì® ñ® T°ì® • ñ®S® ò® ðò®° (Back rest) [ ]
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1 u[PDò® õ® “ò® B +£ò®x] [PO C° “ñ®ì® ò®ì® ñ® À®P® ë® Eì® “Q°®P° ðò®

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\[ \text{ΕΣν 6: Ρọ=} \text{ Α'IΑ} \]

\[ \text{Αρπζου C 'USάυρμνύ Ρọ=} \text{ Α'IΑ} \]

1. \[ \{ \text{Ρọ νU® Gζωνύ ο o o |μ®}$^\text{ε} \text{ o UQΩρPO?} \]
   - A) $< 3 \circ \circ + |μ®| [ ]
   - B) $38.5 \circ \circ + |μ®| [ ]
   - C) $5\&7 \circ \circ + |μ®| [ ]
   - D) $789 \circ \circ + |μ®| [ ]
   - E) $> 9 \circ \circ + |μ®| [ ]

2. \[ \{ \text{Ρọ νU® Gζωνύ ο o o |μ®} \ Αρρζου C 'USQΩρPO? \]
   - A) $< 2 \circ \circ + |μ®| [ ]
   - B) $28.4 \circ \circ + |μ®| [ ]
   - C) $486 \circ \circ + |μ®| [ ]
   - D) $688 \circ \circ + |μ®| [ ]
   - E) $> 8 \circ \circ + |μ®| [ ]

3. \[ \text{Ε[P I B ξ o o A, Gζωνύ ο o o |μ®} \ \text{Ανν} Απ I ΑΑ Ενν''; USΩίνU'' ΕΚQΩρPO? \]
   - A) $< 1 \circ \circ + |μ®| [ ]
   - B) $1\&3 \circ \circ + |μ®| [ ]
   - C) $385 \circ \circ + |μ®| [ ]
   - D) $5\&7 \circ \circ + |μ®| [ ]
   - E) $> 7 \circ \circ + |μ®| [ ]

4. \[ \text{Αρρζου C 'US} = > \text{EdX, ΑρPÚ® {ΩS} + |μ®} \ \text{ΑρPÚ® Φόξ ο'Α34ο + |μ®} \ \text{GΩA IA}? \]
   - A) $< 1\&2 \circ \circ + |μ®| [ ]
   - B) $1\&2 \circ \circ + |μ®| [ ]
   - C) $1\&2 \circ \circ + |μ®| [ ]
   - D) $3\&4 \circ \circ + |μ®| [ ]
   - E) $> 4 \circ \circ + |μ®| [ ]

\[ \text{CεηοΑọ} * B Ρọ=} \text{ Α'IΑ} \]

1. \[ \text{υω [Ρọ, ξ o o B = EdX, Gζωνύ ο o o |μ®} \ \text{Cεη=Αọ Ι GkrxU οRοOΩρPO?} \]
   (Αρπζουννν, ξ o o Α I = C , US® + |μ®|)
   - A) $> 2 \circ \circ + |μ®| [ ]
   - B) $1\&2 - 2 \circ \circ + |μ®| [ ]
   - C) $1\&1\&2 \circ \circ + |μ®| [ ]
   - D) $1\&2 - 1 \circ \circ + |μ®| [ ]

2. \[ \text{Ε[P I B Cεη=Αọ Ι o o B = EdX GιΒÚ o' ΑρPO?} \]
   - A) $ΕκζυΑ [ ]
   - B) $ΕυνAυΑ [ ]
   - C) $00Α [ ]
   - D) $A®, uΑ [ ]
   - E) $00ΑοΑ [ ]

\[ \text{ΕΣν 7: Ε[Αı 'Α Ο0Ο®} \ \text{υω} \text{ UΡọ o Ρọ:} \]

1. \[ \{ \text{Ρọ ξ o o A, R-ČU ΡοKUP''ΕmνοΑΠΙΑ, E[PDοh'' Gs n [Ρọ} \]
   (Α, 'Ε[Ρọ) ΑΥ©νU®ΕκΑξ \]
   i ) \{ \text{Ρọ -Αọ} \ = \ o' '2 o o Α 'OA} \]
   - A) $\text{G'όξξEξ® [ ]}$
   - B) $\text{ίξ} = \text{ό0 [ ]}$
   - C) $\text{G'όξξEυνΑξ [ ]}$
   - D) $\text{A'υξP [ ]}$
   - E) $\text{G'όξξEξ® Αọ} [ ]$

   ii ) \{ \text{Ρọ o' '2 o o οουEΑ} \]
   - A) $\text{G'όξξEξ® [ ]}$
   - B) $\text{ίξ} = \text{ό0 [ ]}$
   - C) $\text{G'όξξEυνΑξ [ ]}$
   - D) $\text{A'υξP [ ]}$
   - E) $\text{G'όξξEξ® Αọ} [ ]$

   iii ) \{ \text{Ε[Ρọ -Αọ} \ = \ Pọ} \text{ AmhΑọ n Ο0Ο® CεηοΑΙ = uo'ouυUS®} \]
   - A) $\text{G'όξξEξ® [ ]}$
   - B) $\text{ίξ} = \text{ό0 [ ]}$
   - C) $\text{G'όξξEυνΑξ [ ]}$
   - D) $\text{A'υξP [ ]}$
   - E) $\text{G'όξξEξ® Αọ} [ ]$

2. \[ \{ \text{ΡΙΙΕ ξ o o ΑΗ0ΕΚ®} \]μμμμ[ΡΙΙΕ +EdX, ο[ΡΙΙΕΡξ o o οιόΠΗ o , ξ} \]
   - A) $\text{G'όξξEξ® [ ]}$
   - B) $\text{ίξ} = \text{ό0 [ ]}$
   - C) $\text{G'όξξEυνΑξ [ ]}$
   - D) $\text{A'υξP [ ]}$
   - E) $\text{G'όξξEξ® Αọ} [ ]$
3 E [PĪB E o °A ΗΩEκ ]μ[ PĪB +€0x, u [PĪB +○°0 h o , €x EuÅ ©0Ω] BuμΑ Qοη` `خ s h?"
A) G`°EδEx( ] B) $° b0 0 [ ] C) G`°EδEUαA x [ ]
D) A°uΩP [ ] E) G`°EδEx°ΑΩ > [ ]
4 Jmκo %zu %U £0°A, E [PĪB E o °Å, ] [PΌν _, νΈμPο PΌ l°Pίo?
A) νμν, νν [ ] B) ΑνP νν, νν [ ] C) νν, νν [ ]
D) Αν, νν [ ] E) ννP [ ]

ESv 8: $ν° Ι°€Α> B¸ zxΑ AOUØP

R], • xS A¼ Åμ°:

1. } [PΩR] • Sx A¼ο~ E n ¢xO l°Pº[ ]
B° [ ] CΑΩ٣> [ ]
2. } [PΩ, Phchu 7 |omP ΑR] • xS A¼° B uβo© GΩAθΩ Ε0ί x?
A) <B © o +μ [ ] B) 8 - 24 © o +μ [ ] C) 1 & 3 |omPO [ ]
D) 3&5 |omPO [ ] E) νU° • © [ ]
3. } [PΩ, Phchu 12 ©u [PĪΑ, R] • xS A¼°0 A ΑAν 2 00 Pº l°A lA?
A) 1 & 3 ΑμP [PΩ [ ] B) 1 & 3 ©u [PΩ [ ]
C) 3&6 ©u [PΩ [ ] D) 6&G ©u [PΩ [ ] E) G`°EδEx( [ ]
4. Phchu 7 |omP ΑA, u [PΩdÅ° R] • xS A¼° B uβo© GΩAθΩ Ε0ί x?
A) ©P Σο0ΑμU A¼ [ ] B) Σο0ΑμU A¼ [ ] C) ©u©U A¼ [ ]
D) Ρκο©°0U A¼ [ ] E) ©PΚκο©°0U A¼ [ ]
5. Phchu 12 ©u [PĪΑ, u [PΩdÅ° R] • xS A¼° B uβo© GΩAθΩ Ε0ί x?
A) ©P Σο0ΑμU A¼ [ ] B) Σο0ΑμU A¼ [ ] C) ©u©U A¼ [ ]
D) Ρκο©°0U A¼ [ ] E) ©PΚκο©°0U A¼ [ ]
6. Phchu 7 |omP ΑA, R] • xS A¼° B Ρμn ©P, u [PΩΑ CU®©P 0°, 28 +Αο > Pº 0 l° ξ o hzVÅ, Αmι Δ, ΟEξEx +EUUS® Ch [PĪΑ] uΑ°zwPº l°?
A) A`°E i JBÖ© CΑΩ» [ ] B) ©P Σο0εu A lA [ ] C) Σο0εu A lA [ ]
D) ΑνP A lA [ ] E) ©P ΑνP A lA [ ]
7. Phchu 12 ©u [PĪΑ, R] • xS A¼° B Ρμn ©P, u [PΩΑ CU®©P 0°, 28 +Αο > Pº l° ξ o hzVÅ, Αmι Δ, ΟEξEx +EUUS® Ch [PĪΑ] uΑ°zwPº l°?
A) A`°E i JBÖ© CΑΩ» [ ] B) ©P Σο0εu A lA [ ] C) Σο0εu A lA [ ]
D) ΑνP A lA [ ] E) ©P ΑνP A lA [ ]
8. u [PĪB R] Sx A¼° B Ρμn ©P [ ] PΌ E o ®00° 0°, xO ØPº[l°?
B° [ ] CΑΩ» [ ]
9. Phchu 12 ©u [PĪΑ, u [PΩdÅ° • xS A¼° B Ρμn ©P, zxΑ Aou 0 |oi ØPºl°?
A) CΑΩ» [ ] B) A°uΩP [ ] C) » ©° [PĪΑ [ ]
D) $° b0 [ ] E) G`°EδEx( (Bed rest) [ ]

217
10. Ο, zxΔ, u[P Β Ρ] • xS Α¼ US GΔΑp o]\] Qao\o] £, ξχομ ο` wº?  
A) ©, εxPΌ  [ ] B) ©, zxUP Ι] [ ]  
C) Εhθ ] Qao\(π]+ °όμμα) [ ] D) AΩoΑ ] Qao\ [ ] E) 600οÅ [ ]

11. u[P Β Ρ] • Σx Α¼ β Ρομn oP o, zxΑ©oУ° Α ΑY©vUP·£mkΩIPtº?  
B© [ ] CΑο» [ ]

12. }[PO, u[PΩοh− Rί • xQÀ HØEmh Pо−® Pοm n oP o, zxΑ©oUA  
σ\BΩOIPtº?  
B© [ ] CΑο» [ ]

u[Пιβ ©»oÜ EuÅUS {ΒΩ & } [PΩ oΔΩOp ©p ΑÜo·£m i Α¼US £v» ІzxOÎPO.
I am doing my Research work (Ph.D) in the Department of Industrial Engineering, Anna University, Guindy, Chennai. My Research topic is ‘A STUDY OF LOWER BACK DISORDERS AMONG INDIAN VEHICLE DRIVERS AND ANALYSIS OF POTENTIAL ENVIRONMENTAL ERGONOMIC RISK FACTORS’. As a part of my research work, I am collecting data from the Drivers and Office staff members through questionnaire. You are requested to kindly provide the information by choosing the answer from among the alternatives given in the questionnaire. It is assured that the information provided by you will be kept confidential and used for the academic purpose only.

LOWER BACK DISORDERS
HEALTH SURVEILLANCE QUESTIONNAIRE

DATE OF INQUIRY:

SECTION A: Personal and General Information

Name : …………………………… Mobile No.: ………………………………………
Address: …………………………………………………………………………………
Post code: ……………………………
Date of birth: ……………………… Sex: ……………………………
Height: ……………….ft/m…………….in/cm Weight: ……………………………
Marital status: ………………………
(Single/married/divorced/separated/widowed)
Educational Qualification: ………………………………………………………………..
Income/month: ………………………………………………………………………...
1. Do you exercise regularly? [ ] Yes [ ] No
2. Do you smoke? [ ] Yes [ ] No
3. Do you chew tobacco? [ ] Yes [ ] No
4. Do you drink alcoholic beverages? [ ] Yes [ ] No

SECTION B: Occupational History

Previous job(s)

1. Did you drive in your previous jobs on vehicle? Yes No
2. Did your previous job(s) involve:
   - Prolonged sitting? [ ] Yes [ ] No
3. Did you ever have low back pain in your previous job(s)? Yes No

Present job (if any)

1. Do you drive any kind of vehicle in your present job? (i.e. car, bus, van, truck, train, tram, helicopter, other) Yes No
   If yes, Please mention the type of vehicle

SECTION C: Intensity of Whole body Vibration

1. How much vibration do you feel during driving?
   - A) Very Mild [ ] B) Mild [ ] C) Moderate [ ] D) Strong [ ] E) Very Strong [ ]
2. Do you experience vehicle jerking during driving?
   - A) Never [ ] B) Seldom [ ] C) Sometimes [ ] D) Often [ ] E) Always [ ]
3. Do you experience vehicle jolting during driving?
   - A) Never [ ] B) Seldom [ ] C) Sometimes [ ] D) Often [ ] E) Always [ ]

SECTION D: Posture

1. Which postures do you adopt when driving?
   - Torso straight: Never Seldom Occasionally Often Always
   - Torso bent: Never Seldom Occasionally Often Always
   - Torso twisted: Never Seldom Occasionally Often Always
SECTION E: Work Environment

Road Condition:

1. On which type of asphalt surface do you drive regularly?
   a) Very Good [ ] b) Good [ ] c) Normal [ ] d) Bad [ ] e) Very Bad [ ]

2. In which environment do you usually drive?
   a) NH [ ] b) SH [ ] c) Mixed [ ] d) MDR [ ] e) City Road [ ]

Seat Condition:

1. How often does your seat bottom out while you are driving?
   a) Never [ ] b) Seldom [ ] c) Occasionally [ ] d) Often [ ] e) Always [ ]

2. What is your opinion of the seat comfort?
   a) Excellent [ ] b) Good [ ] c) Acceptable [ ] d) Unsatisfactory [ ]
   e) Most unsatisfactory [ ]

3. What type of Suspension present in your seat?
   a) Mechanical suspension Yes [ ] No [ ]
   b) Air Suspension Yes [ ] No [ ]
   c) No Suspension Yes [ ] No [ ]

4. Does the locomotive seat you have been using
   Arm rest Yes [ ] No [ ]
   Adjustable lower back support Yes [ ] No [ ]

Discomfort:

Do you experience discomfort by mechanical vibration or shock in your work?

<table>
<thead>
<tr>
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<th>Never</th>
<th>Seldom</th>
<th>Occasionally</th>
<th>Often</th>
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<td>Vertical vibration</td>
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<td>Fore/aft vibration</td>
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<td>Side-to-side vibration</td>
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SECTION F: Duration

Drive Duration:
1. How much time do you travel every day? ………………………
   a) <3 hours b) 3-5 hours c) 5-7 hours d) 7-9 hours e) >9 hours
2. How much time do you drive every day?
   a) <2 hours b) 2-4 hours c) 4-6 hours d) 6-8 hours e) >8 hours
3. How much time did the vibration bothers you during your work day?
   a) < 1 hour b) 1 – 3 hours c) 3 - 5 hours d) 5 – 7 hours e) >7 hours
4. What is the duration of stationary time or crawling during driving?
   a) < ½ hours [ ] b) ½ - 1 hour[ ] c) 1 – 2 hours [ ] d) 3- 4 hours [ ]d) > 4 hours [ ]

Break Duration:
1. Duration of break do you usually take during the work day (getting out of your vehicle)?
   a) >2 hour [ ] b) 1½ - 2 hours [ ] c) 1 - 1½ hours [ ] d) 1/2 – 1 hour [ ]
   e) < 1/2 hour [ ]
2. What do you do during your breaks?
   a) Lay down [ ] b) Walk around [ ] c) Stand [ ] d) Sit [ ] d) Others [ ]

SECTION G: Psychosocial Factors

Psychosocial Work Aspect:
1. In Your job, do you have a choice in deciding:
   i. How you do work?
      a) Always [ ] b) Often [ ] c) Occasionally [ ] d) Seldom [ ] e) Never[ ]
   ii. What you do at Work?
      a) Always [ ] b) Often [ ] c) Occasionally [ ] d) Seldom [ ] e) Never[ ]
   iii. Your work timetable and breaks?
      a) Always [ ] b) Often [ ] c) Occasionally [ ] d) Seldom [ ] e) Never[ ]

Psychosocial Personal Aspect:
1. When you have difficulties in your work, how often do you get help and support from your colleagues?
   a) Always [ ] b) Often [ ] c) Occasionally [ ] d) Seldom [ ] e) Never [ ]
2. When you have difficulties in your work, how often do you get help and support from your supervisor?
   a) Always [ ] b) Often [ ] c) Occasionally [ ] d) Seldom [ ] e) Never [ ]
3. How satisfied have you been with your job as a whole, taking everything into consideration?
   a) Very Much Satisfied[ ] b) Highly Satisfied [ ] c) Satisfied [ ] d) Not Satisfied [ ]
   e) Sad [ ]
SECTION H: Health information of Lower Back Disorder

In this section, you will be asked about trouble you might have had in different parts of the body and at different time periods. **If you never have had any back pain/problem, ignore this section.**

**LBD Prevalence level:**

1. Have you ever had low back trouble (ache, pain or discomfort)? Yes …….. No……..
2. What is the total length of time that you have had low back trouble during the last 7 days?
   a) < 8 hours [ ] b) 8-24 hrs [ ] c) 1 - 3 days [ ] d) 3 - 5 days [ ] e) Everyday [ ]
3. What is the total length of time that you have had low back trouble during the last 12 months?
   a) 1 – 3 weeks [ ] b) 1 - 3 months [ ] c) 3 – 6 months [ ] d) 6-9 months [ ] e) Always [ ]
4. The extent of trouble you had during last 7 days in Lower Back?
   a) Very Less [ ] b) Less [ ] c) Moderate [ ] d) High [ ] e) Severe [ ]
5. The extent of trouble you had during last 12 months in Lower Back?
   a) Very Less [ ] b) Less [ ] c) Moderate [ ] d) High [ ] e) Severe [ ]

**Prevention of Activities:**

1. During last 7 days have you been prevented from carrying out normal activities (job, house work, hobbies) because of trouble in Lower Back?
   a) Not at all [ ] b) To a small extent [ ] c) To Some extent [ ] d) To a large extent [ ] e) To a very large extent. [ ]
2. During last 12 months have you been prevented from carrying out normal activities (job, house work, hobbies) because of trouble in Lower Back?
   b) Not at all [ ] b) To a small extent [ ] c) To Some extent [ ] d) To a large extent [ ] e) To a very large extent. [ ]
Medical Intervention:

1. Have you been seen by a doctor, physiotherapist, chiropractor or other such person because of low back trouble during the last 12 months?
   a) Never  b) Seldom  c) Sometimes  d) Often  e) Always (Bed rest)
2. What treatment did your doctor prescribe? ....................................
   a) Drugs [ ]  b) Ointments [ ]  c) Physical therapy  d) Surgery  e) Others
3. Have you been hospitalized because of low back trouble?
   a) Yes [ ]  b) No [ ]

Thank you very much for your help – You have now completed the confidential questionnaire
### φιλολογικός κατάλογος

**Appendix 4**

**Rl1. xSzus k {ο « ^=Sσ>Α΄ -Έθ0^- Ρουή Προσ Ρο 0} | ΑΥδ.:ΕμI -Α**

**ESv1: -Τ Αμη:ΕμI**

| oε’°:…………………………………………… | oΡ+£] Gs:…………………………………………… |
| ~PΑ¶: 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£SV 3: C^ωνι Av^oĀbubωº

1. [PΩ, ApPÚ [PΩÍ C^-US°,£óx GzuωP^- Av^oĀoU E n °xOī°sP? A) ^P ^ω, xĀoU Av^oĀ [ ] B) ^ω, xĀoU Av^oĀ [ ] C) ^ωéU Av^oĀ [ ] D) AvP°øU Av^oĀ [ ] E) ^P AvP°øU Av^oĀ [ ]

2. [PΩ ApPÚ [PΩÍ C^-US°,£óx vý°uOĐ E n °oA (Jerking) E n °xOī°sP? A) CAω» [ ] B) AµuωP [ ] C) » \° ^ [PĪĄ [ ] D) ¥» ¬o0 [ ] E) G`ówEµwAx [ ]

£SV 4: +ωǒ0°

1. [PΩ ApPÚzou C^-US° £m`zvÄ G€ÂwP^-øU Ehİ C, uωP +ωǒ0zou PΩh`i i ∧°P? G°`ówEŵX° CAω» AµuωP G°`ówEµwAx £» ¬o0 G°`ówEŵX°

+µ0P C, zuA [ ] [ ] [ ] [ ] [ ] [ ]

¬B=ÝoUQ [ ] [ ] [ ] [ ] [ ] [ ]

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£SV 5: £ o \ïði_00e` ČA

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£SV 5: £ o \ïði_00e` ČA

8. [PΩ ACùPëøP £° «n ° 2° ωa`\ω» G€ÂwO EØIx? A) ^P =©ø\øoU £oøn [ ] B) =©ø\øoU £oøn [ ] C) λωψη n °oU £oøn [ ] D) µψ^oU £oøn [ ] E) ^PĀ® µψ^oU £oøn [ ]
\( \Delta \) \( \text{ApP} \):

2. \{PO ACUP\( \text{ApP} \) \( \varepsilon^- \) \( \eta \) \( \omega \) \( \beta \) \( \gamma \) \} \( \xi\)\( \omega \)\( \eta\)\( \varepsilon \):
   A) \( \mu\) \( \lambda\) \( \eta\) \[ \] \[ ]
   B) \( \eta\) \( \mu\) \( \nu\) \( \lambda\) \( \eta\) \[ \]
   D) \( \eta\) \( \lambda\) \[ \]
   E) \( \eta\) \( \lambda\) \[ \]

\( \text{C ApP} \) \( \beta \) \( \varepsilon \)

1. \{PO ApPUZ\( \text{ApP} \) \( \alpha\) \( \gamma\) \( \xi\) \( \omega\) \( \eta\) \( \nu\) \( \lambda\) \( \eta\) \[ \]
   A) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \( \zeta\) \[ \]
   B) \( \alpha\) \( \varepsilon\) \( \delta\) \[ \]
   C) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]
   D) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]

2. \u[PO ApPUZ ApP \( \alpha\) \( \gamma\) \( \xi\) \( \omega\) \( \eta\) \( \nu\) \( \lambda\) \( \eta\) \[ \]
   A) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \( \zeta\) \[ \]
   B) \( \alpha\) \( \varepsilon\) \( \delta\) \[ \]
   C) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]
   D) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]

3. \u[PO ApPUZ ApP \( \alpha\) \( \gamma\) \( \xi\) \( \omega\) \( \eta\) \( \nu\) \( \lambda\) \( \eta\) \[ \]
   A) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \( \zeta\) \[ \]
   B) \( \alpha\) \( \varepsilon\) \( \delta\) \[ \]
   C) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]

4. \u[PO ApPUZ ApP \( \alpha\) \[ \]

\( \Delta \) \( \text{IpP} \)

1. \u[PO ApPUZ ApP \( \alpha\) \( \gamma\) \( \xi\) \( \omega\) \( \eta\) \( \nu\) \( \lambda\) \( \eta\) \[ \]
   A) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \( \zeta\) \[ \]
   B) \( \alpha\) \( \varepsilon\) \( \delta\) \[ \]
   C) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]
   D) \( \alpha\) \( \varepsilon\) \( \delta\) \( \varepsilon\) \[ \]

\( \Delta \) \( \text{ApP} \)
ESv 6: P0» A [A

ΔοΠοζευ Κ' USΑυΟΠμΩ P0» A [A

1. } [P0 v U° GzuΩ ∘ o {μ° Χ Ω UQΩ°PO?
   A) < 3 ∘ o + {μ° [ ]
   B) 2 & 2 ∘ o + {μ° [ ]
   C) 5 & 2 ∘ o + {μ° [ ]
   D) 7 & 2 ∘ o + {μ° [ ]
   E) > 9 ∘ o + {μ° [ ]

2. } [P0 v U° GzuΩ ∘ o {μ° ΔοΠοζευ Κ' USΩ°PO?
   A) < 2 ∘ o + {μ° [ ]
   B) 2 & 2 ∘ o + {μ° [ ]
   C) 4 & 2 ∘ o + {μ° [ ]
   D) 6 & 2 ∘ o + {μ° [ ]
   E) > 8 ∘ o + {μ° [ ]

3. E [ΠΒ χ Ω° Α, GzuΩ ∘ o {μ° ΑΝ°ΑΠ ιΩΑ Εν°; USΩ ιωUP' εΚQΩ°PO?
   A) < 1 2 ∘ o + {μ° [ ]
   B) 1 & 1 2 ∘ o + {μ° [ ]
   C) 3 & 1 ∘ o + {μ° [ ]
   D) 5 & 1 ∘ o + {μ° [ ]
   E) > 7 ∘ o + {μ° [ ]

4. ΔοΠοζευ Κ' US° +ΕδΩ, ΔοΠΟΔι' ΟΩ +{μ° ΟΩ0Ω ΔοΠΟДι' ΦΩX ΩΛΑ¼Ω +{μ°
   GΩEΑ | Α?
   A) < 1/2 2 ∘ o + {μ° [ ]
   B) 1/2 & 1 2 ∘ o + {μ° [ ]
   C) 1 & 1/2 2 ∘ o + {μ° [ ]
   D) 3 & 2 2 ∘ o + {μ° [ ]
   E) > 4 2 ∘ o + {μ° [ ]

Cον+Αο [ * Β P0» A [A

1. ωo [P0, Ω Ω° Β +ΕδΩ, GzuΩ ∘ o {μ° Cον+Αο ΓόΚζΟΩΔ0Ω0Ω°PO?
   (ΔοΠοζευ ζΩν', ΦX ΩΑ I + Ω C, US° +{μ°)
   A) < 2 2 ∘ o + {μ° [ ]
   B) 1 1 2 2 ∘ o + {μ° [ ]
   C) 1 1 2 2 ∘ o + {μ° [ ]
   D) 1 2 2 2 ∘ o + {μ° [ ]
   E) < 1/2 1 2 ∘ o + {μ° [ ]

2. E [ΠΒ Cον+Αο Γ° Β +ΕδΩ GBU Ω' Ω°PO?
   A) ΕΚζΩΑ [ ]
   B) Ε»ΔοΩΑ [ ]
   C) |ΟΩΑ [ ]
   D) Α°, ωΑ [ ]
   E) ΩΟ0ΩΑ [ ]

ESv 7: E [Α° Ω0° \ ω-UPμ o P0;
R² • xs A½ ÄÆµ:

1. ) [PÔR] • Sx A½o ° E n °xOÎ°P [6]
   B [ ] CAo » [ ]

2. ) [PÔ, Phêu 7 | omP ÎAR] • xs A½ ˘ aA AAv ˘00 Pô ≈ A [A]
   A) ß ˘ œ ˘ |µ [ ] B) ß - 24 ß ˘ |µ [ ] C) 183 | omPÔ [ ]
   D) 3&5 | omPÔ [ ] E) vU ˘ * [ ]

3. ) [PÔ, Phêu 12 ˘0u [PÎ, R] • xs A½ ˘ aA AAv ˘00 Pô ≈ A [A]
   A) 183 Aqû [PÔ [ ] B) 183 ˘0u [PÔ [ ]
   C) 3&6 ˘0u [PÔ [ ] D) 6&8 ˘0u [PÔ [ ] E) G ˘0E0ÈX [ ]

4. Phêu 7 | omP Î, u [PDôh – R] • xs A½ ˘ B uBø ˘ GÆAÔ ÈO Îx?
   A) Ô P SoÔøU A½ [ ] B) SoÔøU A½ [ ] C) uÔøU A½ [ ]
   D) Pkø ˘ 0U A½ [ ]
5. Phêu 12 ˘0u [PÎ, u [PDôh – R] • xs A½ ˘ B uBø ˘ GÆAÔ ÈO Îx?
   A) Ô P SoÔøU A½ [ ] B) SoÔøU A½ [ ] C) uÔøU A½ [ ]
6. Phêu 7 | omP Î, R] • xs A½ ˘ B Pôû ˘ ØP, u Ò PÔ ÀÇUP©øP Ó ˘2® ˘4 Ao » PÔ ñ (È œ ˘ hzwÄ, Ami A, œ0ÈÈX ÷-0US® Ch [PÎA] uA ˘0wP [ ]
   A) A” î JBO® CAo » [ ] B) Ô P SoÔøU A [ ] C) SoÔøU A [ ]
   D) AvP A [ ]
7. Phêu 12 ˘0u [PÎ, A] • xs A½ ˘ B Pôû ˘ ØP, u [PÔ ÀÇUP©øP Ó ˘2® ˘4 Ao » PÔ Î (È œ ˘ hzwÄ, Ami A, œ0ÈÈX ÷-0US® Ch [PÎA] uA ˘0wP [ ]
   A) A” î JBO® CAo » [ ] B) Ô P SoÔøU A [ ] C) SoÔøU A [ ]
   D) AvP A [ ]
8. Phêu 12 ˘0u [PÎ, u [PDôh – ] • xs A½ ˘ B Pôû ˘ ØP, zxAøy | i ô PÔ [ ]
   A) CAo » [ ] B) À uÔP [ ] C) À ô [PÎÂ [ ] D) È ˘ œÔ [ ] E) G ˘0E0ÈX (Bed rest) [ ]
9. © zxAø, u [PÎB R] • xs A½4 US GÆAøP ˘0U ] Qao`ô ˘ E ˘xøm ô ˘ ò ô [ ]
   A) ©, ËxPÔ [ ] B) ô, zxAøP [ ] C) Eh0 ] Qao` (a) ˘ ô0µô [ ] D) AÔøA ] Qao` [ ] E) ©00øA [ ]
10. u [PÎB R] • Sx A½ ˘ B Pôû ˘ ØP, zxAø ˘øU ˘ AAY ÷UP ÷EmkÔ1PÔ?
    B [ ] CAo » [ ]
11. } [P∅, u[P∅∅h\ R] \textcircled{•} xQA HØEmh P∅° P∅∅n°∅ P ∅, zxA∅∅Ua ∅\BOO°ї°∅∅ [ø? B® [ ] CÅø» [ ]

u[PÎβ °ờ øÚ EUÀUS |BO &} [P∅ oAØOPμ°∅ P ÆU°] -hooks US ∅v » î zxØ°і°P∅.